PROMISE®
TECHNOLOGY, INC.

SUPERTRAK

TX8650, TX8658

USER MANUAL

Version 1.1

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Recommendations

In the manual, the appearance of products made by other companies, including, but not limited to software, servers, and physical drives, is for the purpose of illustration and explanation only. Promise Technology does not recommend, endorse, prefer, or support any product made by another manufacturer.

Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy, and, if not installed and used in accordance with the instruction may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult Promise Technology, Inc. or an experienced radio or TV technician for help.

This device complies with Part 5 of the FCC Rules. Operation is subject to the following conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Caution

Only digital device equipment CERTIFIED CLASS B should be attached to this equipment and that must have shielded cables.

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Chapter 1: Introduction

- About This Manual, below
- Product Overview (page 2)
- WebPAM PRO Management Software (page 2)

Thank you for purchasing one of Promise Technology's SuperTrak TX8650 or TX8658 SAS/SATA RAID Controller card.

About This Manual

This *User Manual* describes how to setup, use and maintain the SuperTrak RAID controller. It also describes how to use the Web-Based Promise Array Management—Professional (WebPAM PRO) RAID management software.

This manual includes a full table of contents, chapter task lists and numerous cross-references to help you find the specific information you are looking for.

Also included are four levels of notices:

Note

A *Note* provides helpful information such as hints or alternative ways of doing a task.

Important

Important calls attention to an essential step or point required to complete a task. Important items include things often missed.

Caution

A *Caution* informs you of possible equipment damage or loss of data and how to avoid them.

Warning

A *Warning* notifies you of probable equipment damage or loss of data, or the possibility of physical injury, and how to avoid them.

Product Overview

SuperTrak TX8650 and TX8658 are SAS and SATA RAID Controller cards. When used with WebPAM PRO software, the SuperTrak RAID Controllers offer a feature-rich, secure and versatile enterprise-wide RAID solution. The resulting RAID environment allows users and administrators to configure, manage, and monitor everything from single logical drives on local systems to logical drive networks residing in offsite locations.

The SuperTrak TX Series RAID Controller cards support SAS hard drives as well as 1.5 Gb/s and 3.0 Gb/s SATA hard drives. At its core, both SuperTrak card provides advanced RAID management functions: creating logical drives, monitoring them, keeping them online and operating at optimum efficiency. SuperTrak can also perform many other tasks, such as:

- The SuperTrak TX8650 and TX8658 Controller cards support up to 8 SAS or SATA physical drives and RAID levels 0, 1, and 10. With a SAS expander you can attach up to 108 additional drives, for a total of 116 drives.
- Set up a network of SuperTrak RAID servers (all running under different RAID levels) and monitor those servers from any workstation on the network.
- Create a series of SuperTrak RAID networks at any number of offsite locations.
- Monitor and repair SuperTrak RAID logical drives using the Internet from an offsite location—all without compromising the integrity of secure servers.

Hot-Swapping

Attached drives can be *hot swapped* when necessary.

WebPAM PRO Management Software

The Web-Based Promise Array Management—Professional (WebPAM PRO) software offers local and remote management and monitoring of all SuperTrak logical drives that exist anywhere on a network. Browser-based GUI provides email notification of all major events or alarms, memory cache management, drive event logging, logical drive maintenance, rebuild, and access to all components in the RAID configuration (controller, disk arrays, logical drives, physical drives, and enclosure).

For information on using WebPAM PRO, see “Chapter 5: Management with WebPAM PRO” on page 83.

Operating System Support

On the Host PC where you install the SuperTrak controller and WebPAM PRO, Promise Technology recommends:

- Windows Server 2008 SP1 (32 or 64 bit)
- Windows Vista SP1 (32 or 64 bit)
- Windows Server 2003 SP2 (32 or 64 bit)
- Windows XP SP2 (64 bit)
- Windows XP SP3 (32 bit)
- Red Hat Enterprise Linux 5.0, 5.1, 5.2 (32 or 64 bit)
- SuSE Linux Enterprise Server 10 SP2, UP and SMP, (32 or 64 bit)
- SuSE Linux Enterprise Server 10 SP1, UP and SMP, (32 or 64 bit)
- Open SuSE Linux Enterprise Server 10.2, 10.3, 11 (32 or 64 bit)

Browser Support

On the Host PC where you install the SuperTrak controller and WebPAM PRO, you must have one of the following browsers:

- Internet Explorer
- Firefox
- Netscape Navigator

If you do not have one of the above browsers, install the browser first and make it the default browser. Then install WebPAM PRO.

Key Features and Benefits

The following information offers an overview of the major features of the Promise SuperTrak TX8650 and TX8658.

Advanced Hardware Design	
Features	**Benefits**
Supports PCIe x8 bus motherboards	Allows maximum data transfers of up to 2 GB/s in both directions simultaneously to dramatically reduce the time to save and retrieve large files.
Supports RAID 0, 1, and 10	Provides dramatic increase in drive performance and/or fault tolerant options. Offers performance customization and data rebuilds from the BIOS menu.
Supports Serial ATA Specification II	Burst data transfer rates up to 300 MB/s from Serial ATA drives to boost overall system performance.
Supports Serial Attached SCSI Specification	Burst data transfer rates up to 300 MB/s from SAS drives to boost overall system performance.
Independent data channels for SATA and SAS drives	Drives can multiply their data transfer performance when striped together and each drive uses a separate data channel.
Supports multiple logical drives on the same physical drives	Up to 8 logical drives per array, Up to 16 arrays per controller, Up to 116 physical drives per controller, Up to 16 logical drives per controller.
Supports online logical drive expansion	Add disk drives to the array without affecting data availability.
Supports online logical drive migration	Change RAID level without affecting data availability.
Utilizes SuperBuild™ automenu from the SuperTrak onboard BIOS	Has “Auto Setup” option for quick and easy logical drive builds.
Displays status and error checking messages during bootup	Notifies user of possible errors and allows for recovery of mirrored drive logical drives directly from SuperBuild™.
Supports S.M.A.R.T. monitoring and reporting	Polls status at set intervals, reports through WebPAM PRO.

Advanced Hardware Design	
Features	**Benefits**
Employs the latest Promise PCI Express SATA/SAS ASIC technology	Fully supports Serial ATA specifications with 150 and 300 MB/sec timing and CRC error-checking at high speeds.
Automatic background rebuilds	Fault tolerance can be restored automatically without rebooting.
DOS based flash upgrade of BIOS and Firmware	Verifies proper file, option to backup existing file. Download files from Promise website.
Capacity coercion	Supports four schemes of capacity coercion.
System reboot not required after create, delete, migrate or expand logical drive	System boot process continues without restarting.

Compatibility	
Features	**Benefits**
Complies with PCI Express Specification 1.0a	Provides highest level of hardware compatibility
Complies with SATA Specification 1.0a	Provides full compatibility with first generation SATA hard drives.
Complies with SATA II: Extensions to SATA 1.0a Specification	Provides enclosure and drive monitoring compatibility.
Complies with SAS Specification 1.1	Provides full compatibility with SAS hard drives.
Tested compatibility to coexist with motherboards that have integrated IDE controllers	Improves system performance and minimizes system conflicts for new and existing installations.
Features LBA support	Supports drives greater than 137 GB capacity.
Supports BIOS Boot Specification	All logical drives attached to the SuperTrak card appear in the BBS-compliant motherboards BIOS boot list.

Specifications

- Port Counts and Connectors
  TX8650: 8 internal, two SFF-8087
  TX8658: 8 external, two SFF-8088
- Interface: PCI-Express x8 Slot
- I/O Processor: 800 MHz
- Memory (DDR-II): Not used
- Controller card dimensions (HWD):
  2.69 x 5.00 x 0.75 inches (68.3 x 127.0 x 19.0 mm) “Low profile”
- Operating temperatures: 32° to 122°F (0°C to 50°C)
- Operating humidity: 5% to 95% non-condensing

Chapter 2: Installation

- Unpacking the SuperTrak Card, below
- Installing the SuperTrak Card (page 8)
- Choosing the Physical Drives (page 12)
- Creating a Logical Drive (page 13)
- Installing the CLI (page 18)
  - Windows (page 18)
  - Linux (page 23)
- Installing WebPAM PRO (page 30)
  - Windows (page 31)
  - Linux (page 40)
- Logging into WebPAM PRO (page 49)
- Setting up WebPAM PRO (page 51)

Unpacking the SuperTrak Card

When you receive the SuperTrak TX Series SAS/SATA RAID Controller card, the package should contain the items listed below:

- SuperTrak TX8650 or TX8658 Controller card
- *Quick Start Guide*
- 0.5m (19-inch) SFF-8087 to SFF-8482 SAS fanout+power cable
  Two for TX8650 only
- CD with WebPAM PRO software, Windows and Linux drivers, and *SuperTrak User Manual*

If any of the items are missing or appear damaged, please contact your dealer or distributor immediately.

Warning

The electronic components on the SuperTrak TX Controller cards are sensitive to damage from Electro-Static Discharge (ESD). Observe appropriate precautions at all times when handling the SuperTrak card or its subassemblies.

Warning

Before installing the SuperTrak TX Controller card into an existing system, backup any important or useful data. Failure to follow this accepted PC practice could result in data loss.

Important

Promise does not recommend multi-lane and fanout cables longer than 1m (38 inches) because they have not been tested with the SuperTrak controller.

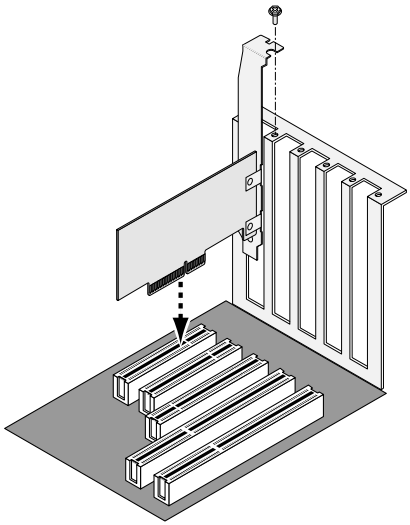
Note

The SuperTrak TX Controller cards are PCI Plug-n-Play (PnP) devices. No changes are necessary in the motherboard CMOS or BIOS Setup for resources or drive types in most applications.

Installing the SuperTrak Card

The SuperTrak TX Controller card fits into any available PCI-Express x8 slot. You can also plug the SuperTrak card into a PCI-Express x16 slot.

1. Remove the cover of your system.
2. Remove the inside slot cover of an available PCI-Express slot on the motherboard.



3. Install the SuperTrak card into the open PCI-Express slot.
4. Fasten the SuperTrak card bracket to the system case.
5. Do one of the following actions:
   - **TX8650:** Attach the multi-lane end of the SAS cable to a SAS port on the SuperTrak card. See Figure 1.

     Attach the power connectors to your system's power supply.

     Attach the fanout+power connectors to your disk drives.
   - **TX8658:** Attach a SAS SFF-8088 cable (not supplied) to one of the SAS ports on the SuperTrak card. See Figure 2.

     Attach the other end of the SAS cable to a SAS port on your enclosure's backplane or to your SAS expander.

     For more information, see the user manual for your enclosure or SAS expander.
6. Optional. Repeat step 5 for the other SAS port on the SuperTrak card.

Figure 1. SuperTrak TX8650 card

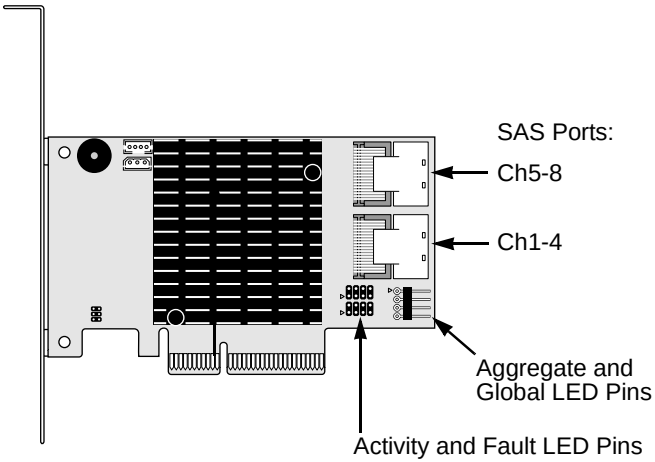
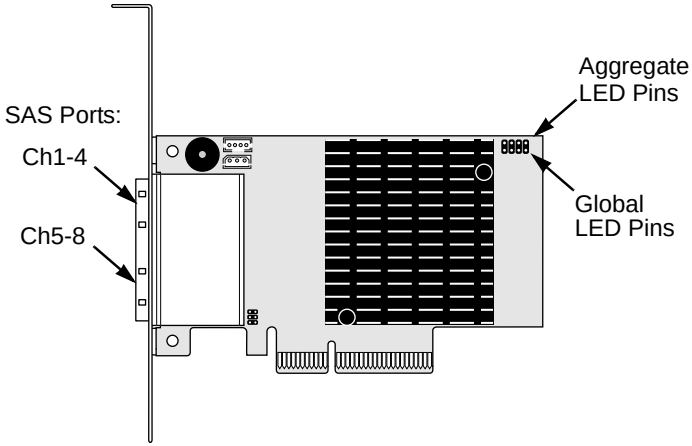
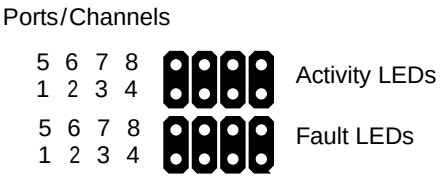


Figure 2. SuperTrak TX8658 card



7. Optional. Attach cables from the LED pins on the SuperTrak card to the LEDs in your PC or enclosure. See Figures 3, 4, and 5.

Figure 3. Individual LED pins, TX8650



There are no individual LED pins for external SAS ports.

Figure 4. Global and Aggregate LED pins, TX8650

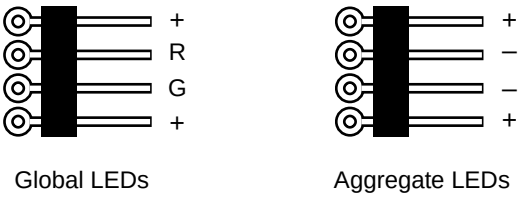
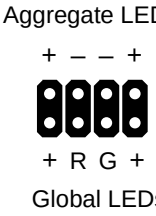


Figure 5. Global and Aggregate LED pins, TX8658

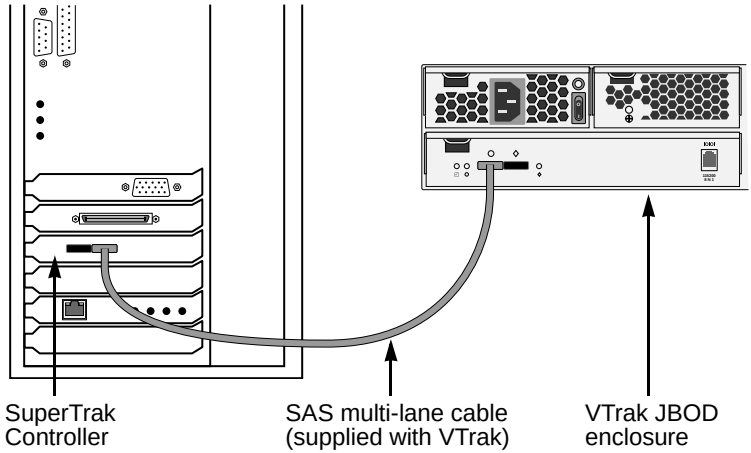


Connecting SuperTrak to a VTrak JBOD Enclosure

If you are connecting the SuperTrak card to a single VTrak JBOD enclosure, you can attach the SAS multi-lane cable to either the **circle** or **diamond** port on the enclosure.

However, if you plan to cascade multiple VTrak JBOD enclosures, you must attach the SAS multi-lane cable to the **circle** port on the first enclosure.

Figure 6. Attaching the SAS multi-lane cable to the diamond port



Choosing the Physical Drives

The SuperTrak TX Controller card supports SAS and 1.5-Gb/s or 3.0-Gb/s SATA physical drives. For optimal performance, install physical drives of the same model and capacity.

Level	Number of Drives
RAID 0	1 or more
RAID 1	2 only
RAID 10	4 or more*
* Requires an even number of drives	

The table above shows the number of drives required for each RAID level.

Creating a Logical Drive

You can use the SuperBuild™ Utility to create a logical drive with the attached physical drives. You can also use WebPAM PRO and the Command Line Interface (CLI) to create your logical drives.

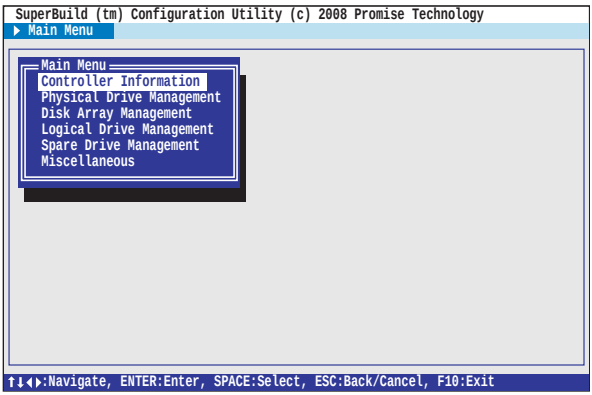
Note

For an explanation of the logical drive concepts and the choices you can make when you create your logical drive, see “Chapter 7: Technology Background” on page 167.

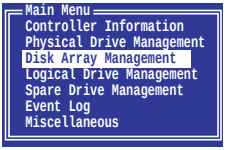
1. Boot your system. If this is the first time you have booted with the SuperTrak card and physical drives installed, the SuperTrak BIOS will display the following screen.

SuperTrak TX Series BIOS Version 3.0.0.26
(c) 2004-2008 Promise Technology, Inc. All rights reserved.
Controller 1:
ID Logical Drive Name Capacity Status
No Logical Drive is defined ...
Press <Ctrl> + <S> to enter SuperBuild (tm) Configuration Utility or
Press <Esc> or <Space> to continue

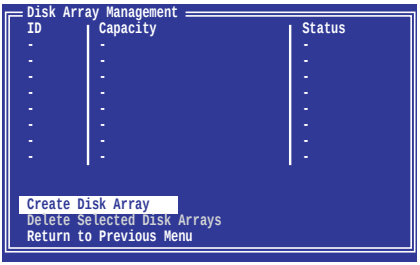
2. Press the Ctrl-S keys to display the SuperBuild Utility Main Menu.



3. Press the arrow keys to highlight *Disk Array Management* and press Enter.

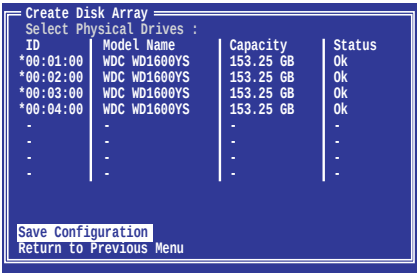


The Disk Array Management screen appears.



4. Highlight *Create Disk Array* and press Enter.

The Create Disk Array screen appears.



Use this screen to select the physical drives for your disk array.

5. Press the arrow keys to highlight a physical drive. Then press the spacebar to select the physical drive.

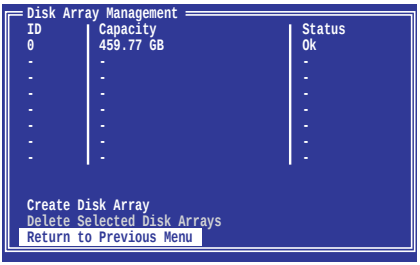
An asterisk (*) appears at the left of each selected physical drive.

The first number under ID refers to the enclosure. The second pair of numbers refer to the individual physical drive.

6. Highlight *Save Configuration* and press Enter.

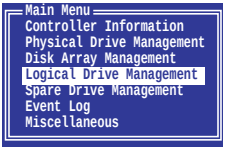
The Disk Array Management screen appears, showing your new disk array

7. Highlight *Return to Previous Menu* and press Enter.



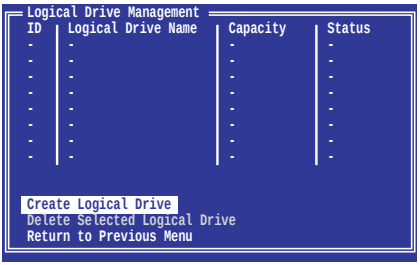
The Main Menu appears.

8. Highlight *Logical Drive Management* and press Enter.



The Logical Drive Management screen appears.

9. Highlight *Create Logical Drive* and press Enter.

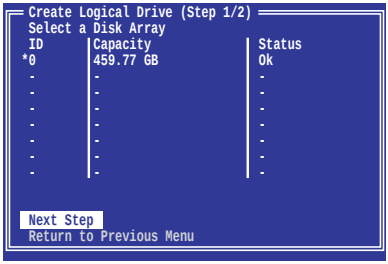


The Create Logical Drive Step 1/2 screen appears.

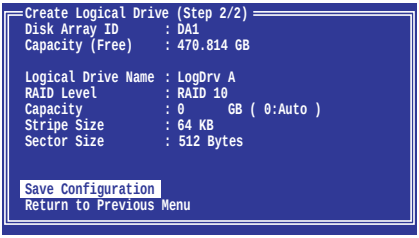
10. Press the arrow keys to highlight a disk array. Then press the spacebar to choose the disk array.

    An asterisk (*) appears at the left of the chosen disk array.

11. Highlight *Next Step* and press Enter.



The Create Logical Drive Step 2/2 screen appears.


Create Logical Drive (Step 2/2)
Disk Array ID : DA1
Capacity (Free) : 470.814 GB
Logical Drive Name : LogDrv A
RAID Level : RAID 10
Capacity : 0 GB (0:Auto)
Stripe Size : 64 KB
Sector Size : 512 Bytes
Save Configuration
Return to Previous Menu

12. Press the arrow keys to highlight *Logical Drive Name*. Type a name for your logical drive and press Enter.
13. Optional. You can change any of the following parameters or use the default settings.
    - To change the RAID Level, highlight *RAID Level* and press Enter.

      In the popup menu, highlight your choice of RAID Level and press Enter.

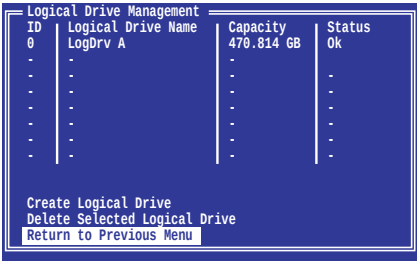
      The available RAID Levels depend on the number of physical drives you selected for your disk array.
    - To use less than the full physical drive capacity for this logical drive, highlight *Capacity* and type the new capacity in GB to allocate to this logical drive.

      Later, you can assign the unused capacity to additional logical drives.
    - To change the Stripe Size, highlight *Stripe Size* and press Enter.

      Highlight your choice of *64 KB* or *128 KB* and press Enter.
    - To change the Sector Size, highlight *Sector Size* and press Enter.

      Use the default 512 Bytes. Only exceptions are logical drives larger than 2 TB on Windows XP 32-bit. See page 178 for more information.
14. Highlight *Save Configuration* and press Enter.

    The Logical Drive Management screen appears with your new logical drive.



At this point you can create additional logical drives, if there is physical drive space available. To create another logical drive, repeat steps 8 through 14 above.

15. Press the F10 key to exit the SuperBuild utility and press Y to confirm and restart the computer.

    Do not press the Ctrl-Alt-Del keys. Do not press the Esc key.

You have successfully created a new RAID logical drive.

Important

You must be partition and format your new logical drive before you can use it. Use the same method of partitioning and formatting a logical drive as you would any other fixed disk added to your computer system.

Installing the CLI

The Command Line Interface (CLI) provides rapid setup of disk arrays and logical drives. You can also manage your SuperTrak system using the CLI.

Installing onto Windows

To install the CLI onto your Windows PC or server:

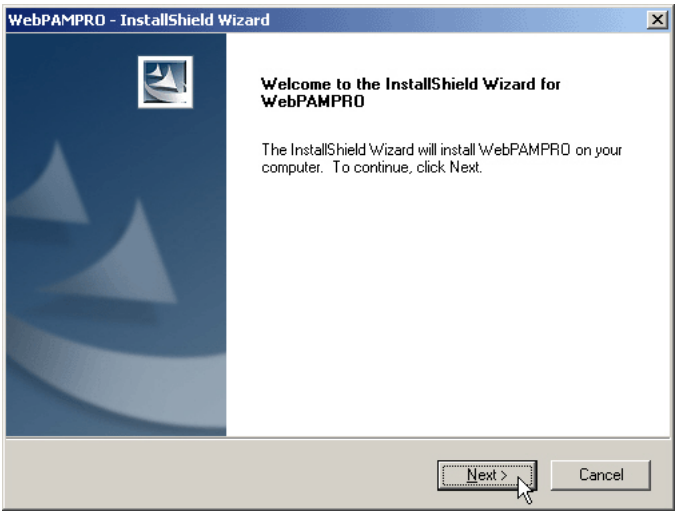
1. Boot the PC or server, launch Windows, and log in as the Administrator.

   If the computer is already running, exit all programs. If you are not logged in as the Administrator, log out, then log in again as the Administrator.
2. Insert the Software CD into your CD-ROM drive.

   The installer window opens automatically.
3. Click the **CLI/SNMP** button, then click the **Install CLI for Windows** button.

   The first CLI installation dialog box appears.
4. In the Introduction dialog box, click the **Next** button to proceed with installation.

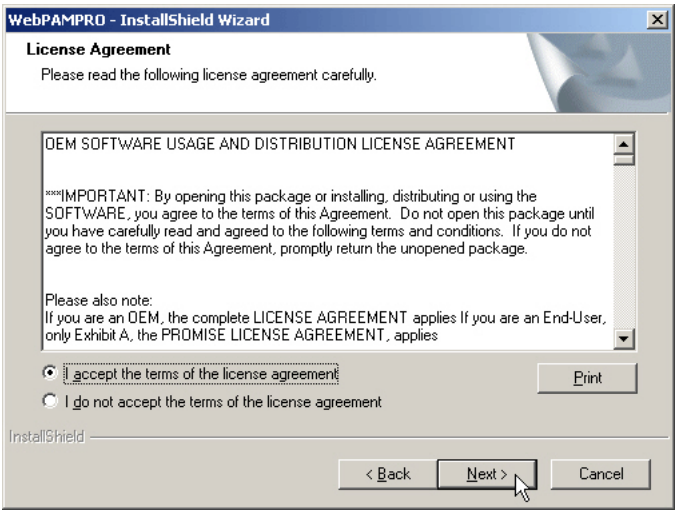
Figure 7. Introduction dialog box


WebPAMPRO - InstallShield Wizard
Welcome to the InstallShield Wizard for WebPAMPRO
The InstallShield Wizard will install WebPAMPRO on your computer. To continue, click Next.
Next >
Cancel

The CLI uses the same installer as WebPAM PRO. Even though the dialog boxes say “WebPAM PRO,” this procedure installs the CLI.

5. In the License Agreement dialog box, choose the **I accept...** option, then click the **Next** button.

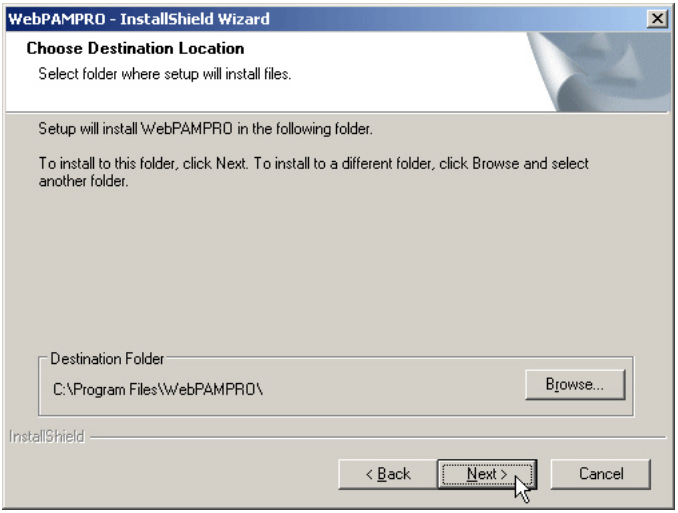
Figure 8. License Agreement dialog box


WebPAMPRO - InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
OEM SOFTWARE USAGE AND DISTRIBUTION LICENSE AGREEMENT
***IMPORTANT: By opening this package or installing, distributing or using the SOFTWARE, you agree to the terms of this Agreement. Do not open this package until you have carefully read and agreed to the following terms and conditions. If you do not agree to the terms of this Agreement, promptly return the unopened package.
Please also note:
If you are an OEM, the complete LICENSE AGREEMENT applies If you are an End-User, only Exhibit A, the PROMISE LICENSE AGREEMENT, applies
I accept the terms of the license agreement
I do not accept the terms of the license agreement
Print
InstallShield
< Back
Next >
Cancel

6. In the Choose Destination Location dialog box, you can:
   - Accept the default installation folder (recommended)
   - Specify a different installation folder (advanced users)

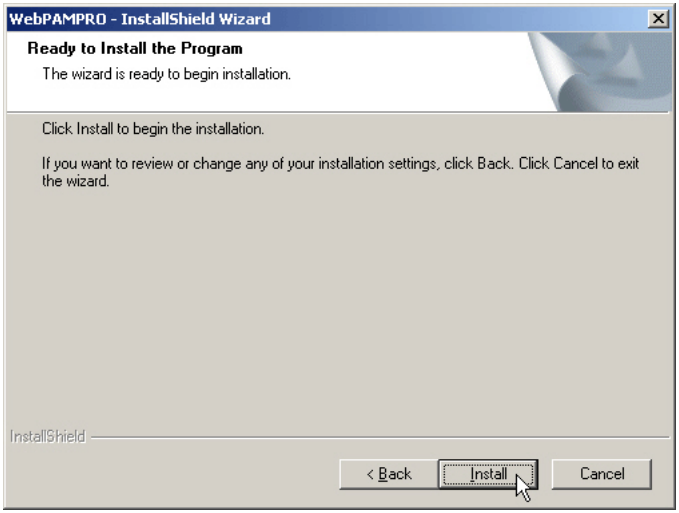
   When you agree with the proposed installation folder, click the **Next** button.

Figure 9. Choose Destination Location dialog box


WebPAMPRO - InstallShield Wizard
Choose Destination Location
Select folder where setup will install files.
Setup will install WebPAMPRO in the following folder.
To install to this folder, click Next. To install to a different folder, click Browse and select another folder.
Destination Folder
C:\Program Files\WebPAMPRO\
Browse...
InstallShield
< Back
Next >
Cancel

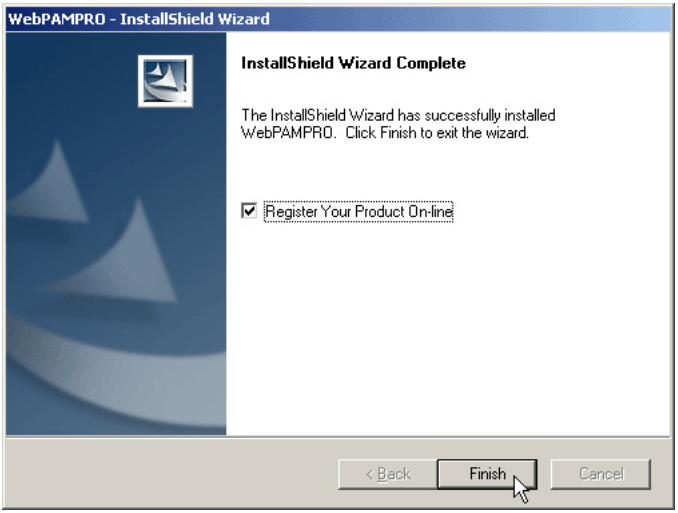
7. In the Ready to Install dialog box, click the **Install** button to continue.

Figure 10. Ready to Install dialog box


WebPAMPRO - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel

8. In the Install Complete dialog box, click the **Finish** button to exit the installer.

Figure 11. Install Complete dialog box


WebPAMPRO - InstallShield Wizard
InstallShield Wizard Complete
The InstallShield Wizard has successfully installed WebPAMPRO. Click Finish to exit the wizard.
Register Your Product On-line
< Back
Finish
Cancel

With the Register Your Product Online box checked, your browser will open and go directly to the Promise product registration website. Thank you for taking the time to register.

To open the CLI, click the **CLI icon** on the desktop (right).

Go to “Chapter 6: Management with the CLI” on page 143 for information about using this application.

Installing onto Linux

Important

Check the *SuperTrak Read Me* file for any issues pertaining to the distribution and version of Linux OS running on your PC or server.

For Linux PCs, Promise offers two different binary files:

- **WebPAM PRO and CLI** – Installs either or both WebPAM PRO and the CLI
- **CLI only** – Installs only the CLI

Note that both of these binary files open in a terminal window and both files use the WebPAM PRO installer. The procedure below installs the CLI only. To install WebPAM PRO, see page 40.

To install the CLI onto your Linux PC or Server:

1. Boot the PC or server, log in as **root**, and launch the Linux GUI.

   If the computer is already running, exit all programs. If you are not logged in as **root**, log out, then log in again as **root**.
2. Insert the Software CD into your CD-ROM drive.
3. Copy the **CLI_Installer...linux.bin** file from the Software CD **\CLI\Linux** directory to the **/root** directory on your PC.
4. Open a terminal window and type **sh** followed by the exact name of the **CLI_Installer...linux.bin** file, then press Enter.

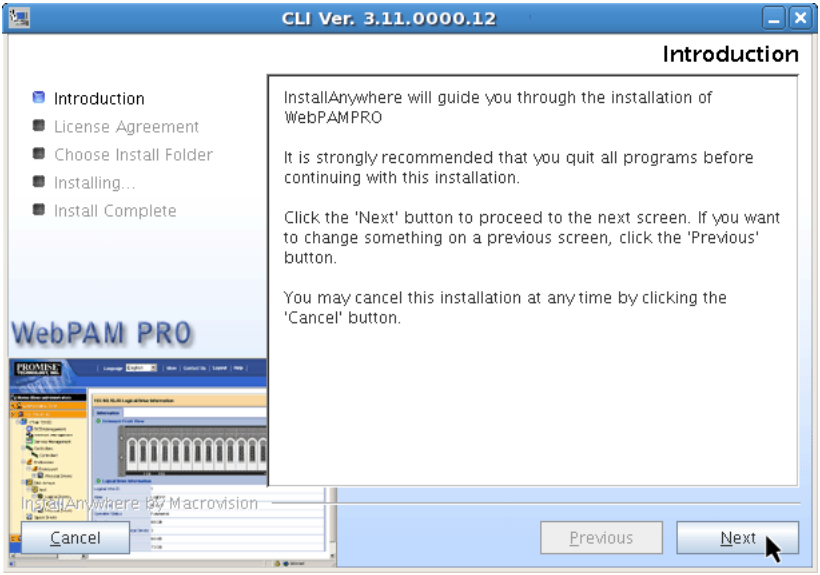
Note

For silent installation, type **sh** followed by the exact name of the **CLI_Installer...linux.bin** file, followed by **-i silent**, then press Enter.

After several moments, the first installation dialog box appears.

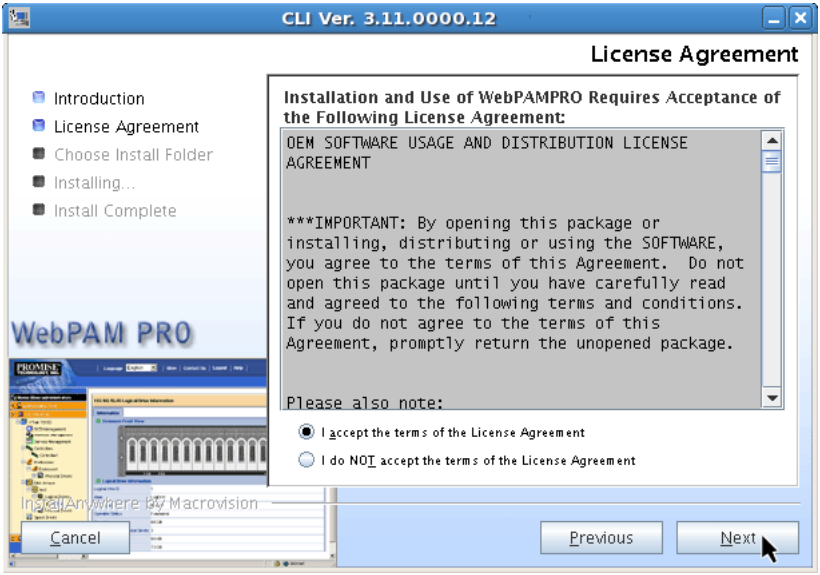
5. In the Introduction dialog box, click the **Next** button to proceed with installation.

Figure 12. Introduction dialog box


CLI Ver. 3.11.0000.12
Introduction
Introduction
License Agreement
Choose Install Folder
Installing...
Install Complete
InstallAnywhere will guide you through the installation of WebPAMPRO
It is strongly recommended that you quit all programs before continuing with this installation.
Click the 'Next' button to proceed to the next screen. If you want to change something on a previous screen, click the 'Previous' button.
You may cancel this installation at any time by clicking the 'Cancel' button.
WebPAM PRO
InstallAnywhere by Macrovision
Cancel
Previous
Next

6. In the License Agreement dialog box, choose the **I accept...** option, then click the **Next** button.

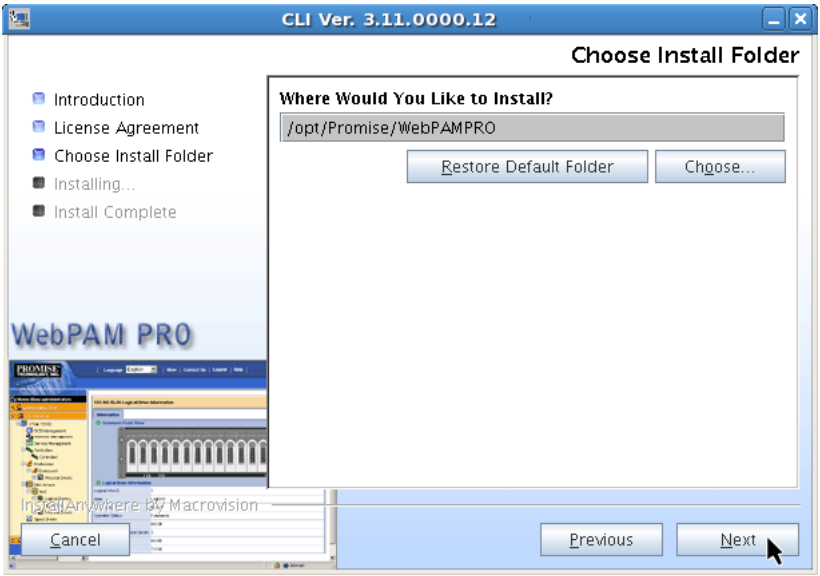
Figure 13. License Agreement dialog box


CLI Ver. 3.11.0000.12
License Agreement
Introduction
License Agreement
Choose Install Folder
Installing...
Install Complete
WebPAM PRO
Installation and Use of WebPAMPRO Requires Acceptance of the Following License Agreement:
OEM SOFTWARE USAGE AND DISTRIBUTION LICENSE AGREEMENT
***IMPORTANT: By opening this package or installing, distributing or using the SOFTWARE, you agree to the terms of this Agreement. Do not open this package until you have carefully read and agreed to the following terms and conditions. If you do not agree to the terms of this Agreement, promptly return the unopened package.
Please also note:
I accept the terms of the License Agreement
I do NOT accept the terms of the License Agreement
InstallAnywhere by Macrovision
Cancel
Previous
Next

7. When the Choose Install Folder dialog box appears, you can:
   - Accept the default installation folder (recommended)
   - Specify a different installation folder (advanced users)

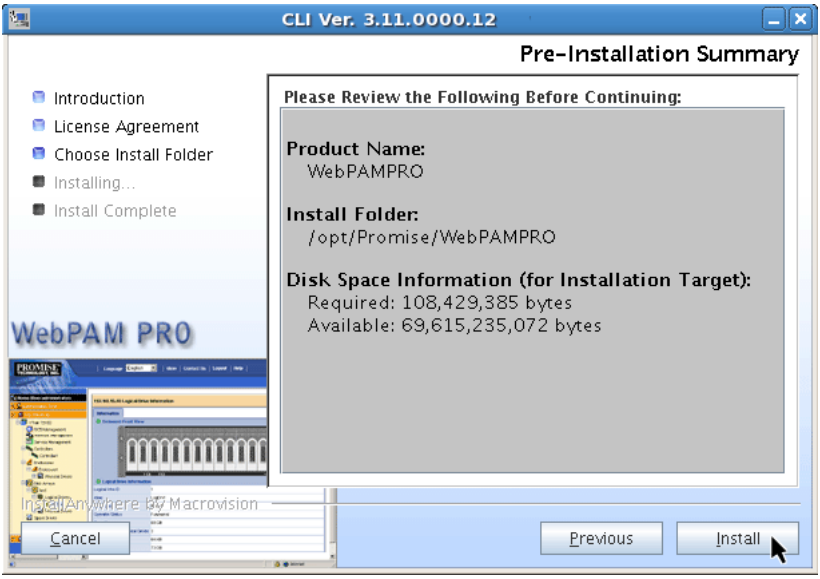
   When you agree with the proposed installation folder, click the **Next** button.

Figure 14. Choose Install Folder dialog box



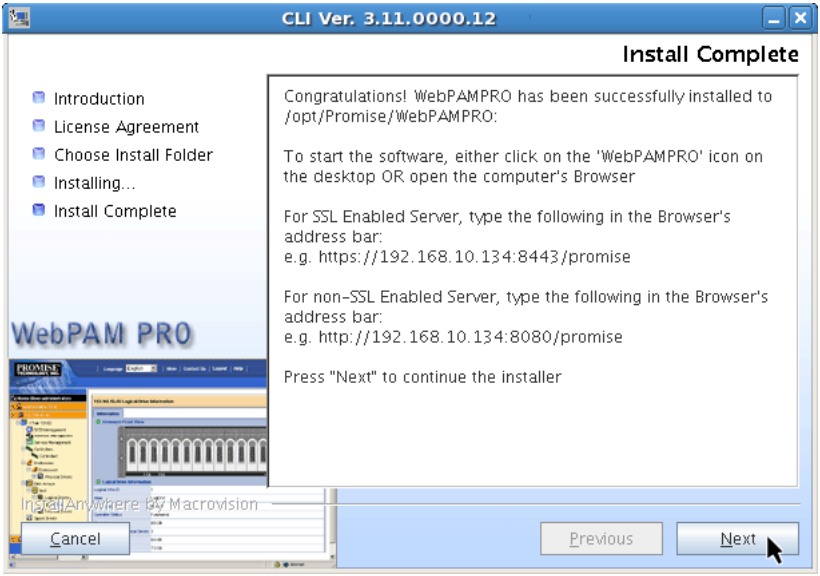
8. In the Pre-Installation Summary dialog box, click the **Install** button to continue.

Figure 15. Pre-Installation Summary dialog box



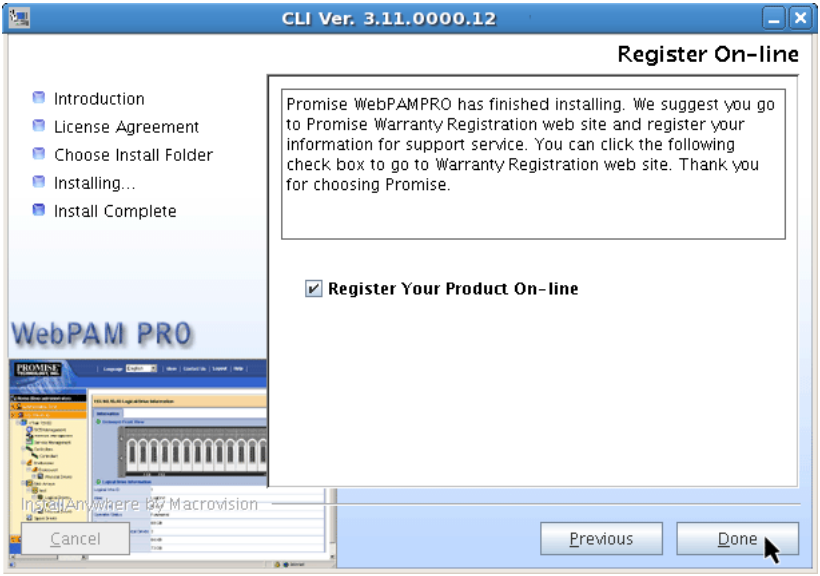
9. In the Install Complete dialog box, click the **Next** button to continue.

Figure 16.Install Compete dialog box


CLI Ver. 3.11.0000.12
Install Complete
Introduction
License Agreement
Choose Install Folder
Installing...
Install Complete
Congratulations! WebPAMPRO has been successfully installed to /opt/Promise/WebPAMPRO:
To start the software, either click on the 'WebPAMPRO' icon on the desktop OR open the computer's Browser
For SSL Enabled Server, type the following in the Browser's address bar:
e.g. https://192.168.10.134:8443/promise
For non-SSL Enabled Server, type the following in the Browser's address bar:
e.g. http://192.168.10.134:8080/promise
Press "Next" to continue the installer
WebPAM PRO
InstallAnywhere by Macrovision
Cancel
Previous
Next

10. In the Register On-line dialog box, click the **Done** button to exit the installer

Figure 17. Register On-line dialog box


CLI Ver. 3.11.0000.12
Register On-line
Introduction
License Agreement
Choose Install Folder
Installing...
Install Complete
Promise WebPAMPRO has finished installing. We suggest you go to Promise Warranty Registration web site and register your information for support service. You can click the following check box to go to Warranty Registration web site. Thank you for choosing Promise.
Register Your Product On-line
WebPAM PRO
InstallAnywhere by Macrovision
Cancel
Previous
Done

With the Register Your Product On-line box checked, your browser will open and go directly to the Promise product registration website. Thank you for taking the time to register.

Go to the **/opt/Promise/WebPAMPRO/Agent/bin** directory and type **./cliib** to start the CLI.

Go to “Chapter 6: Management with the CLI” on page 143 for information about using this application.

Installing WebPAM PRO

WebPAM PRO adds three components to your PC or server:

- Utility Server
- Agent
- Command Line Interface (CLI)

Utility Server

The Utility Server can run on the Host PC (where the SuperTrak card is installed), or on a networked PC, if your WebPAM PRO system includes remote management over a network. You run the Utility Server by directing your browser to the IP address of the Host PC.

Agent

The Agent runs on the Host PC (where the SuperTrak card is installed). After you have logged into the Utility Server through WebPAM PRO, the Utility Server accesses the Agent on the Host PC. The Agent has its own Java Runtime Environment (JRE).

Operating System Support

On the Host PC where you install the SuperTrak controller and WebPAM PRO, Promise Technology recommends:

- Windows Server 2008 SP1 (32 or 64 bit)
- Windows Vista SP1 (32 or 64 bit)
- Windows Server 2003 SP2 (32 or 64 bit)
- Windows XP SP2 (64 bit)
- Windows XP SP3 (32 bit)
- Red Hat Enterprise Linux 5.0, 5.1, 5.2 (32 or 64 bit)
- SuSE Linux Enterprise Server 10 SP2, UP and SMP, (32 or 64 bit)
- SuSE Linux Enterprise Server 10 SP1, UP and SMP, (32 or 64 bit)
- Open SuSE Linux Enterprise Server 10.2, 10.3, 11 (32 or 64 bit)

Choose one of these operating systems to take full advantage of all the features of WebPAM PRO.

Internet Browser

Typically an Internet browser comes with your operating system. The WebPAM PRO installer does not include a browser. For computers that will remotely monitor and manage the RAID, the browser is the only software required.

Browser Support

Choose the latest version of the following browsers to use with WebPAM PRO:

- Internet Explorer
- Firefox
- Netscape Navigator

If you do not have one of the above browsers on the Host PC, install the browser first and make it the default browser. Then install WebPAM PRO.

Important

Install the SuperTrak driver for your operating system before installing WebPAM PRO. See “Chapter 3: Installing Drivers” on page 53 for instructions.

Caution

If you have WebPAM or an earlier version of WebPAM PRO on your PC or server, manually uninstall them before you install WebPAM PRO from the Software CD.

Go to one of the following procedures:

- “Installing WebPAM PRO onto Windows” below.
- “Installing WebPAM PRO onto Linux” on page 40.

Installing WebPAM PRO onto Windows

To install WebPAM PRO onto your Windows-based PC or server:

1. Boot the PC or server, launch Windows, and log in as the Administrator.

   If the computer is already running, exit all programs. If you are not logged in as the Administrator, log out, then log in again as the Administrator.

2. Insert the Software CD into your CD-ROM drive.

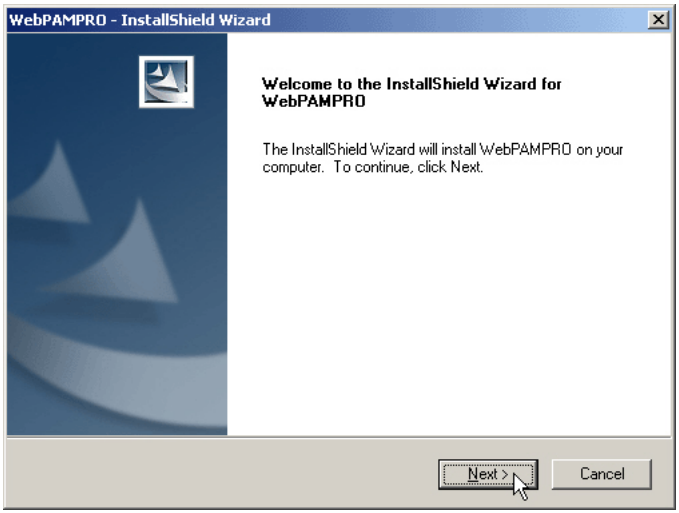
   The installer window opens automatically.

3. Click the **WebPAM PRO Software** button, then click the **Install WebPAM PRO for Windows** button.

   The first WebPAM PRO installation dialog box appears.

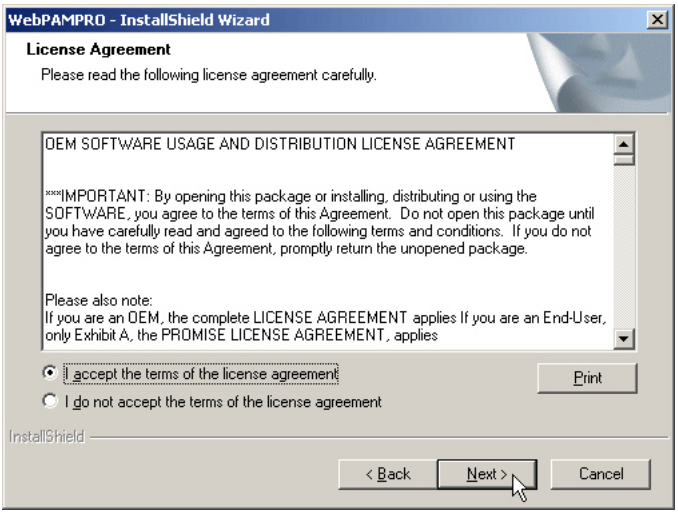
4. In the Introduction dialog box, click the **Next** button to proceed with installation.

Figure 18. Introduction dialog box


WebPAMPRO - InstallShield Wizard
Welcome to the InstallShield Wizard for WebPAMPRO
The InstallShield Wizard will install WebPAMPRO on your computer. To continue, click Next.
Next >
Cancel

5. In the License Agreement dialog box, choose the **I accept...** option, then click the **Next** button.

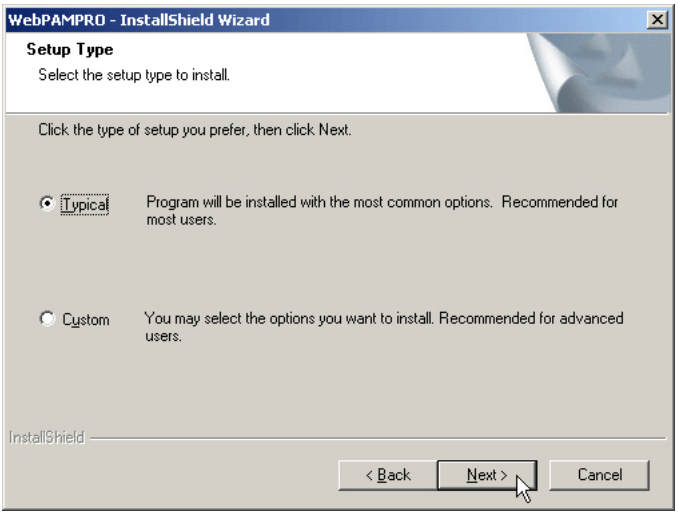
Figure 19. License Agreement dialog box


WebPAMPRO - InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
OEM SOFTWARE USAGE AND DISTRIBUTION LICENSE AGREEMENT
***IMPORTANT: By opening this package or installing, distributing or using the SOFTWARE, you agree to the terms of this Agreement. Do not open this package until you have carefully read and agreed to the following terms and conditions. If you do not agree to the terms of this Agreement, promptly return the unopened package.
Please also note:
If you are an OEM, the complete LICENSE AGREEMENT applies If you are an End-User, only Exhibit A, the PROMISE LICENSE AGREEMENT, applies
I accept the terms of the license agreement
I do not accept the terms of the license agreement
Print
InstallShield
< Back
Next >
Cancel

6. In the Setup Type dialog box, choose the option you prefer:
   - **Typical** – Installs the Agent, Server, and CLI. Recommended for most users.
   - **Custom** – Enables you to choose which components to install. Optional for advanced users.

   Click the **Next** button to continue.

Figure 20. Setup Type dialog box


WebPAMPRO - InstallShield Wizard
Setup Type
Select the setup type to install.
Click the type of setup you prefer, then click Next.
Typical
Program will be installed with the most common options. Recommended for most users.
Custom
You may select the options you want to install. Recommended for advanced users.
InstallShield
< Back
Next >
Cancel

7. Optional. If you chose the Custom option, the Select Features dialog box appears. Choose any combination of three options:
   - **Agent Feature** – The Agent is required on the Host PC (where the SuperTrak card is installed) and for In-band management of subsystems.
   - **Server Feature** – The Utility Server is required for local or remote management.

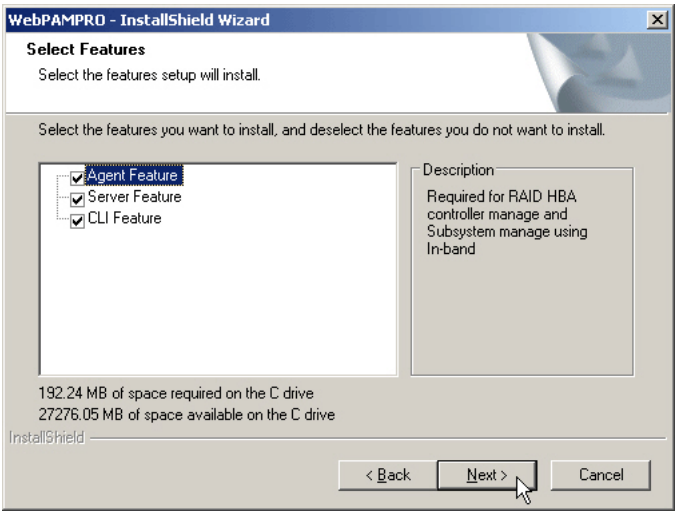
     If you have a network, install the Server on one of your networked PCs.

     If you have only local management, install the Server on the Host PC (where the SuperTrak card is installed).
   - **CLI Feature** – The Command Line Interface runs on the Host PC (where the SuperTrak card is installed) and provides local management only.

   Checked items will be installed. Uncheck items you do *not* want to install.

   Click the **Next** button to continue.

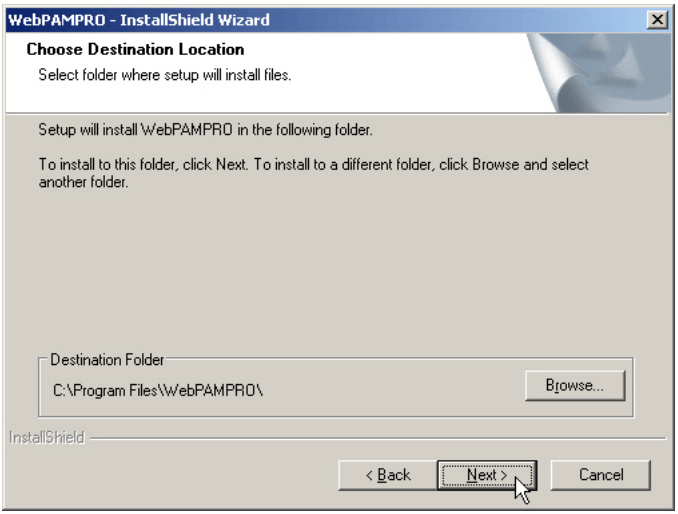
Figure 21. Custom Setup dialog box


WebPAMPRO - InstallShield Wizard
Select Features
Select the features setup will install.
Select the features you want to install, and deselect the features you do not want to install.
Agent Feature
Server Feature
CLI Feature
Description
Required for RAID HBA controller manage and Subsystem manage using In-band
192.24 MB of space required on the C drive
27276.05 MB of space available on the C drive
InstallShield
< Back
Next >
Cancel

8. In the Choose Destination Location dialog box, you can:
   - Accept the default installation folder. Recommended for most users.
   - Specify a different installation folder. Optional for advanced users.

   When you agree with the proposed installation folder, click the **Next** button.

Figure 22. Choose Destination Location dialog box


WebPAMPRO - InstallShield Wizard
Choose Destination Location
Select folder where setup will install files.
Setup will install WebPAMPRO in the following folder.
To install to this folder, click Next. To install to a different folder, click Browse and select another folder.
Destination Folder
C:\Program Files\WebPAMPRO\
Browse...
InstallShield
< Back
Next >
Cancel

9. In the WebPAM PRO Server dialog box, check the box to select SSL security.

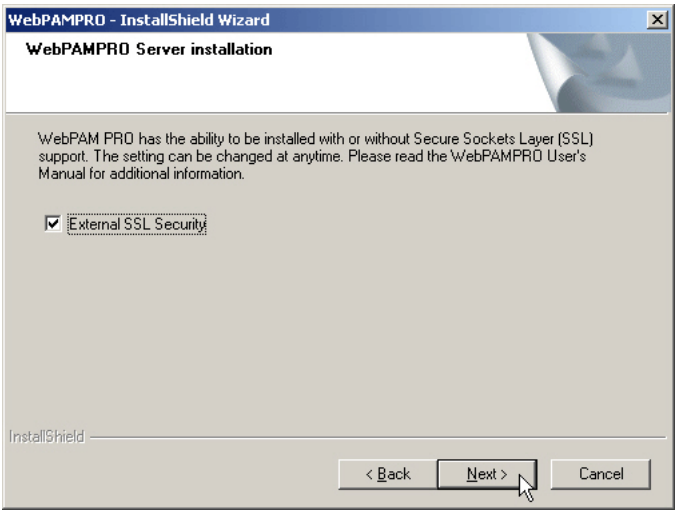
   External SSL Security – Applies security to all connections involving the Internet or outside your company firewall.

   Security options are invisible to authorized users.

   Promise Technology provides a default certificate for the server as well as for internal data communication. However, in some cases it is better to install and verify your own certificate for the webserver. And, if possible, verify the certificate by a certificate authority such as Verisign or Thwate. See your MIS Administrator for guidance.

   Click the **Next** button to continue.

Figure 23. WebPAM PRO Server dialog box

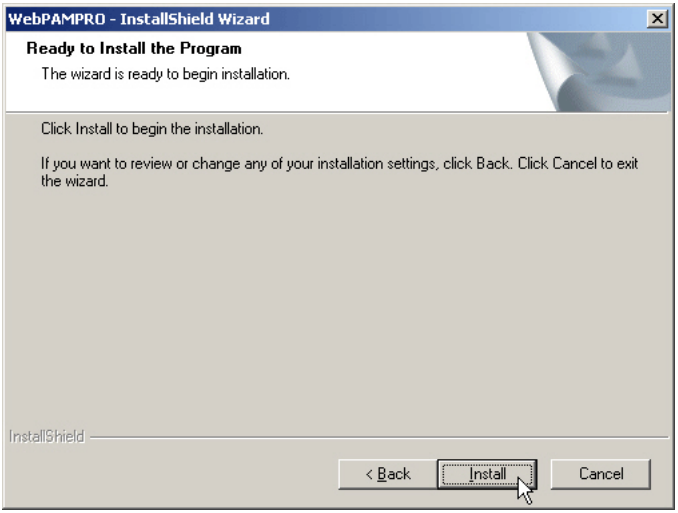

WebPAMPRO - InstallShield Wizard
WebPAMPRO Server installation
WebPAM PRO has the ability to be installed with or without Secure Sockets Layer (SSL) support. The setting can be changed at anytime. Please read the WebPAMPRO User's Manual for additional information.
External SSL Security
InstallShield
< Back
Next >
Cancel

Note

If you are only installing the CLI and Agent, this dialog box does not appear.

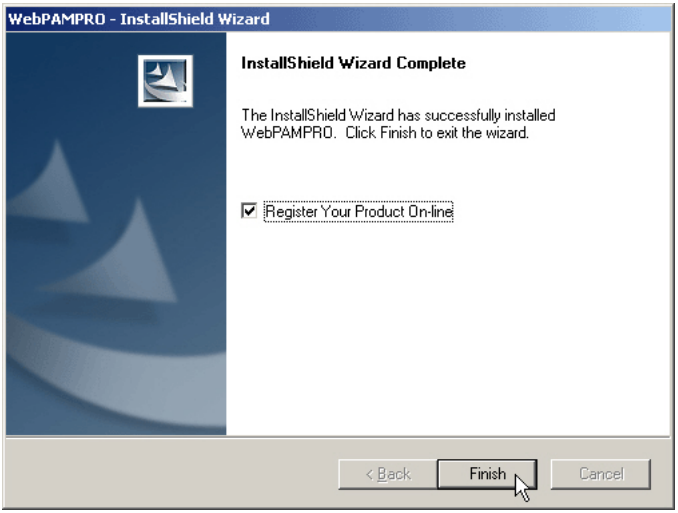
10. In the Ready to Install dialog box, click the **Install** button to continue.

Figure 24. Ready to Install dialog box


WebPAMPRO - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel

11. In the Install Complete dialog box, click the **Finish** button to exit the installer.

Figure 25. Install Complete dialog box


WebPAMPRO - InstallShield Wizard
InstallShield Wizard Complete
The InstallShield Wizard has successfully installed WebPAMPRO. Click Finish to exit the wizard.
Register Your Product On-line
< Back
Finish
Cancel

With the Register Your Product Online box checked, your browser will open and go directly to the Promise product registration website. Thank you for taking the time to register.

This completes the WebPAM PRO installation for Windows. Go to “Logging into WebPAM PRO” on page 49.

Installing WebPAM PRO onto Linux

Important

Check the *SuperTrak Read Me* file for any issues pertaining to the distribution and version of Linux OS that you are running.

To install WebPAM PRO onto your Linux-based PC or server:

1. Boot the PC or server, log in as **root**, and launch the Linux GUI.

   If the computer is already running, exit all programs. If you are not logged in as **root**, log out, then log in again as **root**.
2. Insert the Software CD into your CD-ROM drive.
3. Go to the WebPAM PRO / Linux directory on the CD-ROM and copy the **WebPAMPRO...Linux.bin** file to the root directory.
4. Open a terminal window and type **sh** followed by the exact name of the **WebPAMPRO...Linux.bin** file, then press Enter.

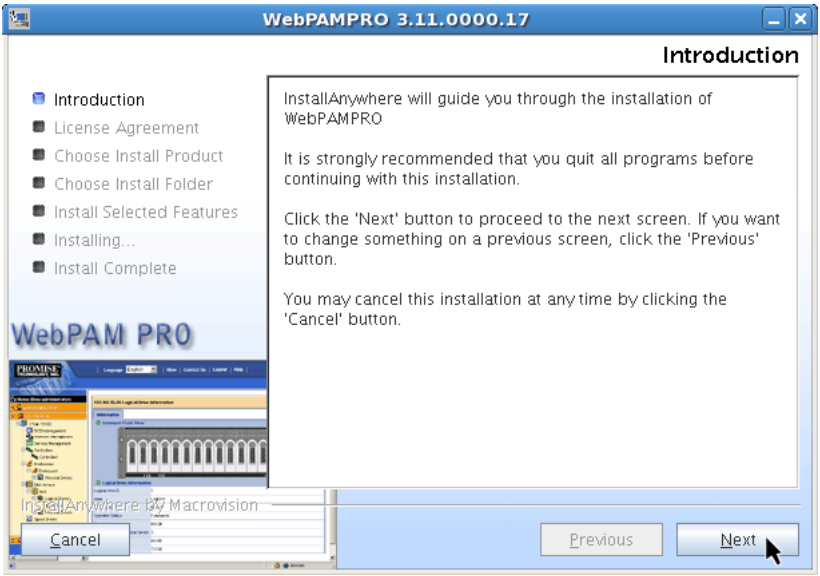
Note

For silent installation, type **sh** followed by the exact name of the **WebPAMPRO...linux.bin** file, followed by **-i silent**, then press Enter.

After several moments, the first WebPAM PRO installation dialog box appears.

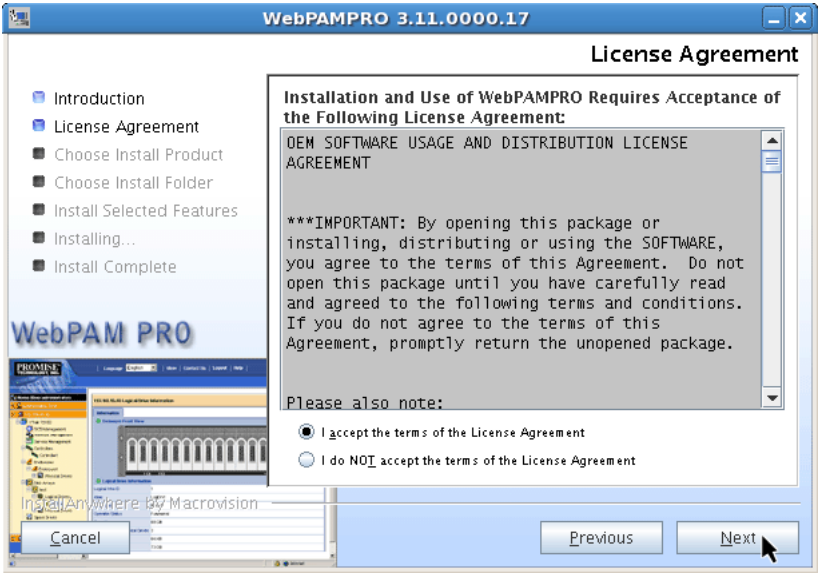
5. In the Introduction dialog box, click the **Next** button to proceed with installation.

Figure 26. Introduction dialog box


WebPAMPRO 3.11.0000.17
Introduction
Introduction
License Agreement
Choose Install Product
Choose Install Folder
Install Selected Features
Installing...
Install Complete
InstallAnywhere will guide you through the installation of WebPAMPRO
It is strongly recommended that you quit all programs before continuing with this installation.
Click the 'Next' button to proceed to the next screen. If you want to change something on a previous screen, click the 'Previous' button.
You may cancel this installation at any time by clicking the 'Cancel' button.
WebPAM PRO
InstallAnywhere by Macrovision
Cancel
Previous
Next

6. In the License Agreement dialog box, choose the **I accept...** option, then click the **Next** button.

Figure 27. License Agreement dialog box

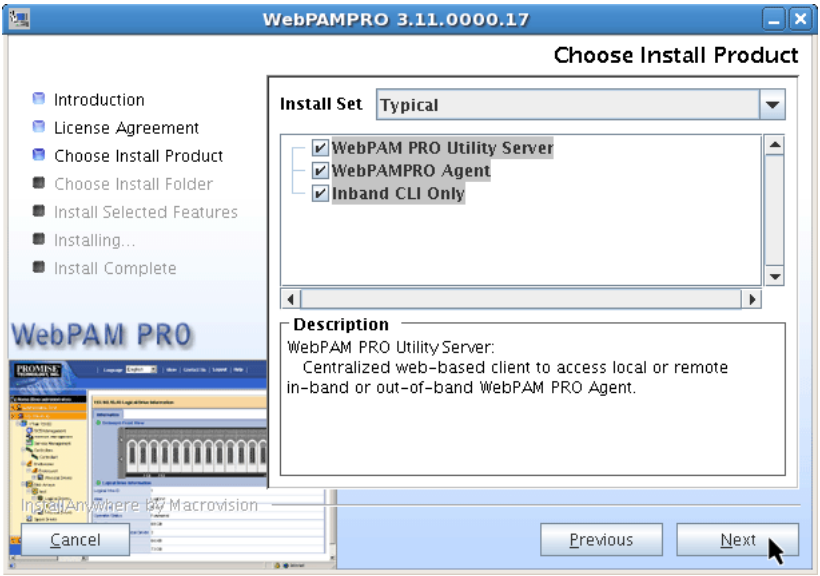

WebPAMPRO 3.11.0000.17
License Agreement
Introduction
License Agreement
Choose Install Product
Choose Install Folder
Install Selected Features
Installing...
Install Complete
WebPAM PRO
Installation and Use of WebPAMPRO Requires Acceptance of the Following License Agreement:
OEM SOFTWARE USAGE AND DISTRIBUTION LICENSE AGREEMENT
***IMPORTANT: By opening this package or installing, distributing or using the SOFTWARE, you agree to the terms of this Agreement. Do not open this package until you have carefully read and agreed to the following terms and conditions. If you do not agree to the terms of this Agreement, promptly return the unopened package.
Please also note:
I accept the terms of the License Agreement
I do NOT accept the terms of the License Agreement
InstallAnywhere by Macrovision
Cancel
Previous
Next

7. In the Choose Install Product dialog box, choose any combination of three options:
   - **WebPAM PRO Utility Server** – One Server must be installed on the network, or on the Host PC if there is only local management
   - **WebPAM PRO Agent** – The Agent must be installed on every PC or Server where a SuperTrak Controller card has been installed
   - **Inband CLI Only** – Installs the Command Line Interface (CLI) You can install the CLI now or at a later time.

   Checked items will be installed. Uncheck items you do *not* want to install.

   Click the **Next** button to continue.

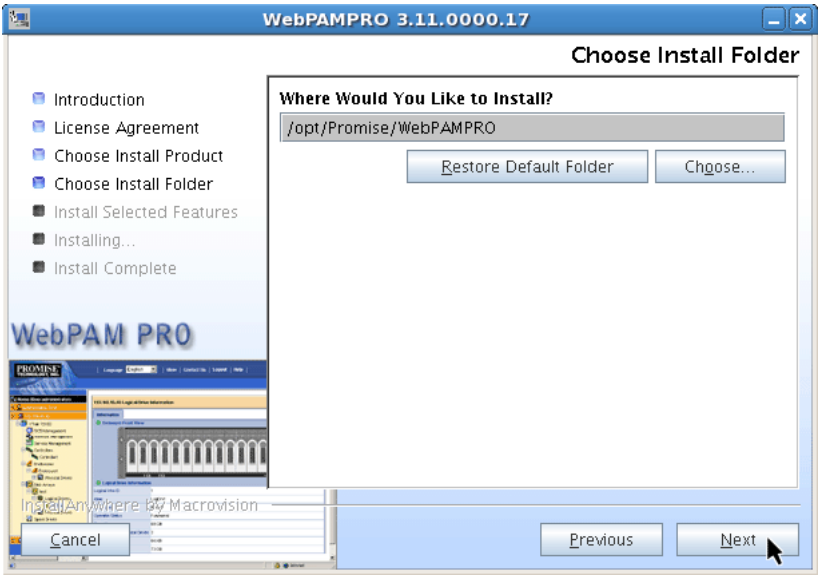
Figure 28. Choose Install Product dialog box



8. When the Choose Install Folder dialog box appears, you can:
   - Accept the default installation folder. Recommended for most users.
   - Specify a different installation folder. Optional for advanced users.

   When you agree with the proposed installation folder, click the **Next** button.

Figure 29. Choose Install Folder dialog box



9. In the SSL Security Options dialog box, check the box to select SSL security.

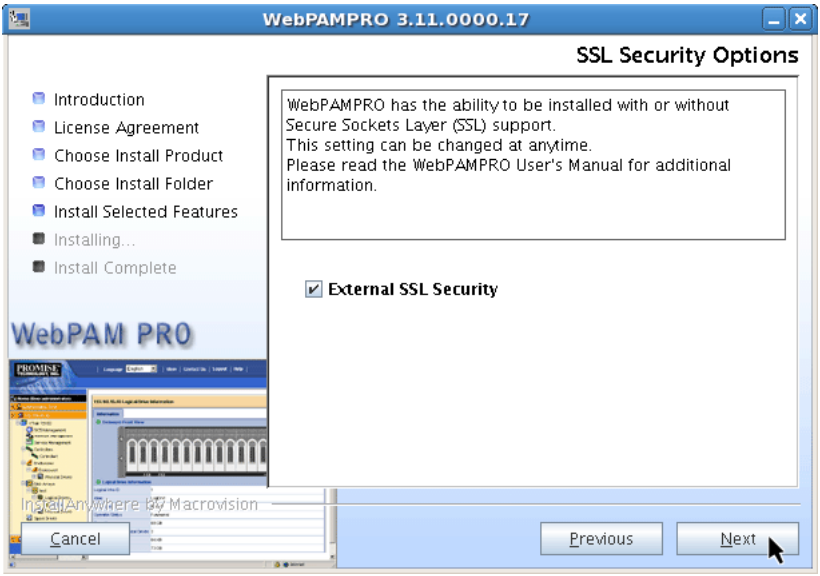
   External SSL Security – Applies security to all connections involving the Internet or outside your company firewall.

   Security options are invisible to authorized users.

   Promise Technology provides a default certificate for the server as well as for internal data communication. However, in some cases it is better to install and verify your own certificate for the webserver. And, if possible, verify the certificate by a certificate authority such as Verisign or Thwate. See your MIS Administrator for guidance.

   Click the **Next** button to continue.

Figure 30. SSL Security Options dialog box

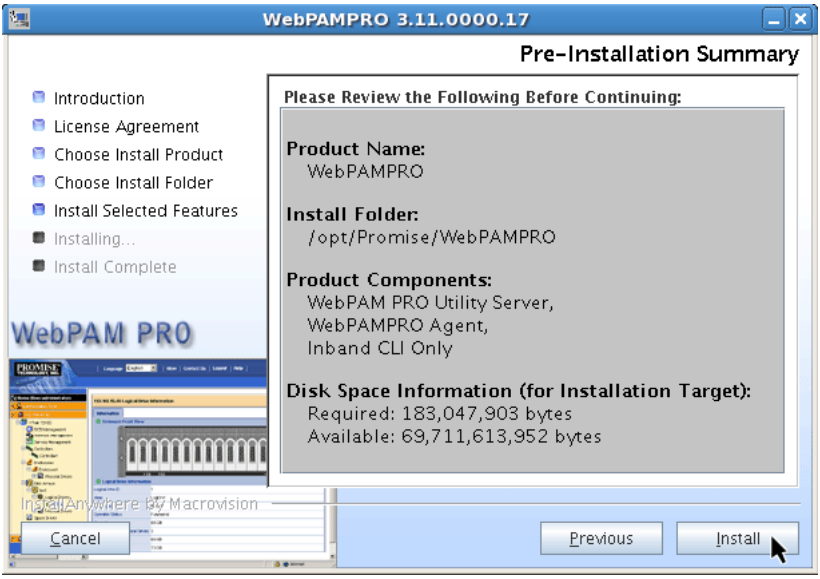


Note

If you are only installing the CLI, this dialog box does not appear.

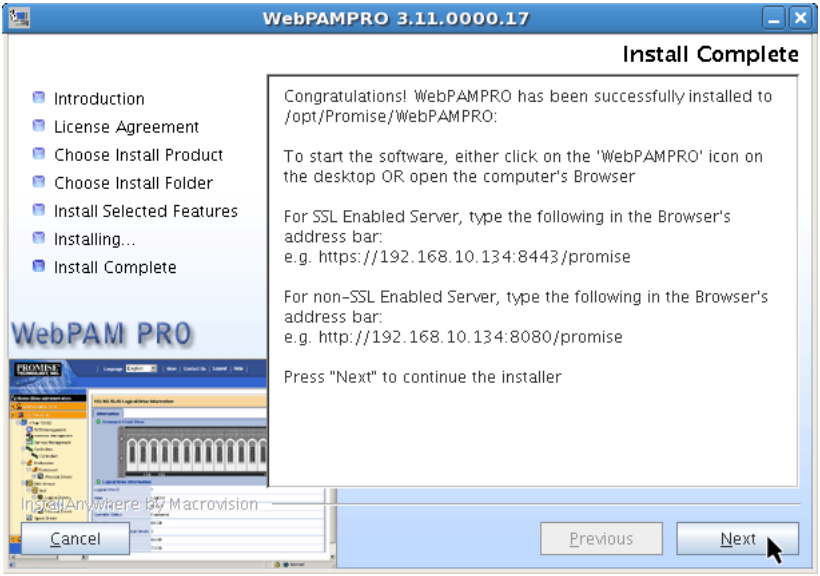
10. In the Pre-Installation Summary dialog box, click the **Install** button to continue.

Figure 31. Pre-Installation Summary dialog box



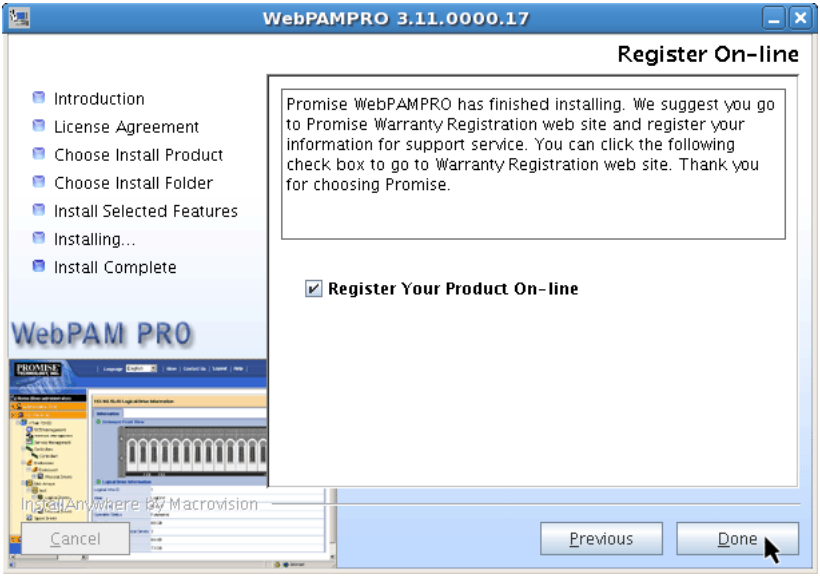
11. In the Install Complete dialog box, click the **Next** button to continue.

Figure 32.Install Compete dialog box


WebPAMPRO 3.11.0000.17
Install Complete
Introduction
License Agreement
Choose Install Product
Choose Install Folder
Install Selected Features
Installing...
Install Complete
WebPAM PRO
Congratulations! WebPAMPRO has been successfully installed to /opt/Promise/WebPAMPRO:
To start the software, either click on the 'WebPAMPRO' icon on the desktop OR open the computer's Browser
For SSL Enabled Server, type the following in the Browser's address bar:
e.g. https://192.168.10.134:8443/promise
For non-SSL Enabled Server, type the following in the Browser's address bar:
e.g. http://192.168.10.134:8080/promise
Press "Next" to continue the installer
InstallAnywhere by Macrovision
Cancel
Previous
Next

12. In the Register On-line dialog box, click the **Done** button to exit the installer

Figure 33. Register On-line dialog box


WebPAMPRO 3.11.0000.17
Register On-line
Introduction
License Agreement
Choose Install Product
Choose Install Folder
Install Selected Features
Installing...
Install Complete
Promise WebPAMPRO has finished installing. We suggest you go to Promise Warranty Registration web site and register your information for support service. You can click the following check box to go to Warranty Registration web site. Thank you for choosing Promise.
Register Your Product On-line
WebPAM PRO
InstallAnywhere by Macrovision
Cancel
Previous
Done

With the Register Your Product On-line box checked, your browser will open and go directly to the Promise product registration website. Thank you for taking the time to register.

Note

The first time you install WebPAM PRO on a RedHat Linux system, the WebPAM PRO icon appears on the desktop but not in the application menu. Please log out, then log in again, and the WebPAM PRO icon will thereafter appear in the application menu.

This completes the WebPAM PRO installation for Linux. Go to “Logging into WebPAM PRO” on page 49.

Logging into WebPAM PRO

You can log into WebPAM PRO in either of two ways:

- Logging in at the Host PC (page 49)
- Logging in over the Network (page 49)

Logging in at the Host PC

At the Host PC (where the SuperTrak TX Controller is installed), do one of the following actions:

- Double-click the WebPAM PRO desktop icon.
- Choose *WebPAM PRO* in the Windows Programs menu.
- Choose *WebPAM PRO* in the Linux Applications menu.
- Follow the steps under “Logging in over the Network”.

Logging in over the Network

You can log into WebPAM PRO from any PC with a network connection to the Host PC (where the SuperTrak TX Controller is installed).

1. Launch your Browser.
2. In the Browser address field, type the information provided below. Then press Enter.

   If you selected External SSL Security during installation (Windows, see page 37; Linux, see page 45), use the *Secure Connection*. Otherwise, use the *Regular Connection*.

Regular Connection

- WebPAM PRO uses an HTTP connection. . . . . .http://
- Enter the Host PC’s IP address 192.168.10.228
- Enter the Port number . . . . . :8080
- Add promise to launch WebPAM PRO . . . . . /promise

Together, your entry looks like this:

http://192.168.10.228:8080/promise

Secure Connection

- WebPAM PRO uses a secure HTTP connection . . . . . .https://
- Enter the Host PC’s IP address 192.168.10.228
- Enter the Port number . . . . . :8443
- Add promise to launch WebPAM PRO . . . . . /promise

Together, your entry looks like this:

https://192.168.10.228:8443/promise

Notes

- You can enter the Host PC's network name in place of the IP address.
- If you are logging in at the Host PC, you can enter **localhost** in place of the IP address.
- Whether you select a regular or a secure connection, your WebPAM PRO user name and password are always secure.

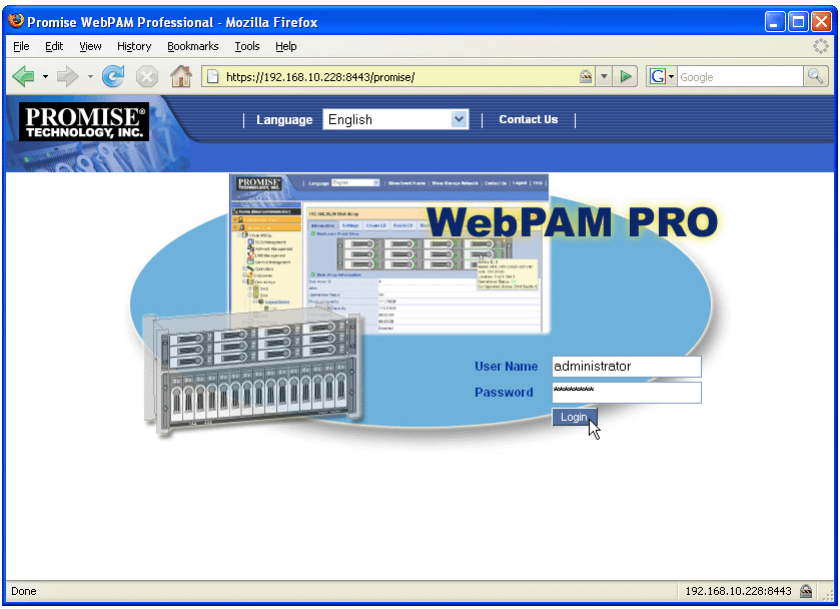
Login Screen

When the opening screen appears:

1. Type **administrator** in the User Name field.
2. Type **password** in the Password field.
3. Click the **Login** button.

   The User Name and Password are case sensitive. See Figure 34.

Figure 34. The WebPAM PRO login screen



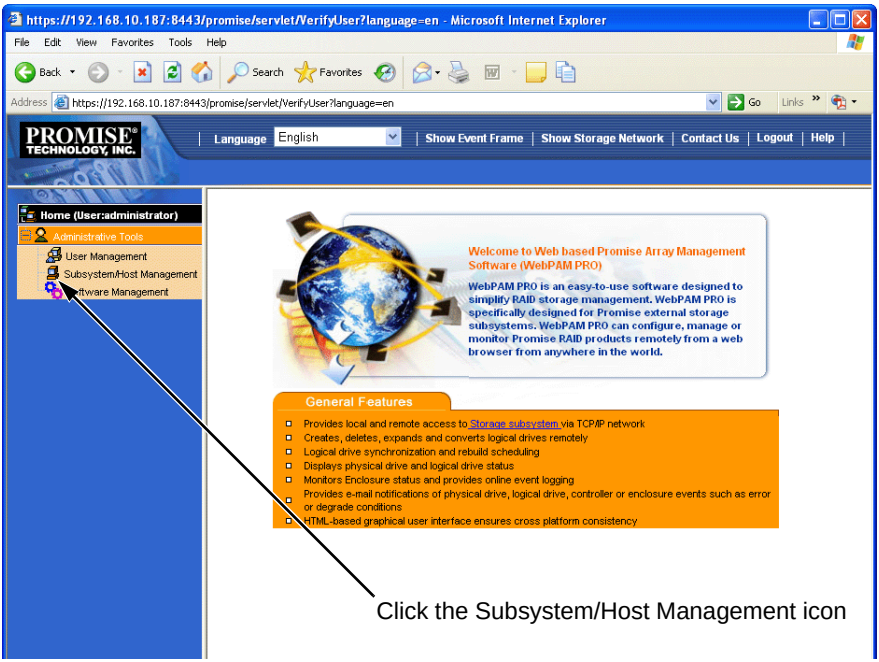
Setting up WebPAM PRO

The first time you use WebPAM PRO, you must add the Host PC so that WebPAM PRO will recognize it. You only need to perform this procedure once.

To add the Host PC:

1. In the Tree, click the Subsystem/Host Management icon.
   See Figure 35.

Figure 35. WebPAM PRO initial login screen

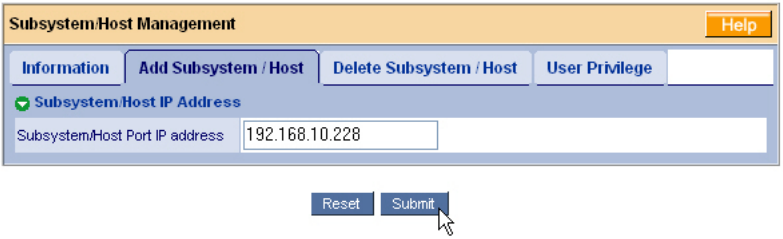

https://192.168.10.187:8443/promise/servlet/VerifyUser?language=en - Microsoft Internet Explorer
PROMISE TECHNOLOGY, INC.
Language
English
Show Event Frame
Show Storage Network
Contact Us
Logout
Help
Home (User:administrator)
Administrative Tools
User Management
Subsystem/Host Management
Welcome to Web based Promise Array Management Software (WebPAM PRO)
WebPAM PRO is an easy-to-use software designed to simplify RAID storage management. WebPAM PRO is specifically designed for Promise external storage subsystems. WebPAM PRO can configure, manage or monitor Promise RAID products remotely from a web browser from anywhere in the world.
General Features
Provides local and remote access to Storage subsystem via TCP/IP network
Creates, deletes, expands and converts logical drives remotely
Logical drive synchronization and rebuild scheduling
Displays physical drive and logical drive status
Monitors Enclosure status and provides online event logging
Provides e-mail notifications of physical drive, logical drive, controller or enclosure events such as error or degrade conditions
HTML-based graphical user interface ensures cross platform consistency
Click the Subsystem/Host Management icon

2. Click the **Add Subsystem/Host** tab.
3. In the Subsystem/Host Port IP address field, type the IP address of the Host PC where you installed the SuperTrak TX Controller card.

   If you are working at the same Host PC where the SuperTrak card is installed, you can also type **127.0.0.1** in the IP address field.

   Entries such as *localhost* or the Host PC's network name do not work for this function.

Figure 36. Add Subsystem/Host tab



4. Click the **Submit** button.

   The newly added host appears in the Tree, on the left side of the WebPAM PRO screen.

This completes the WebPAM PRO installation and initial setup. Go to “Chapter 5: Management with WebPAM PRO” on page 83 for information about using this application.

Chapter 3: Installing Drivers

- Driver Installation Media
  - Windows (page 54)
  - Linux (page 55)
- Windows Server 2008
  - New OS Installation (page 56)
  - Existing System (page 57)
  - Confirming Driver Installation (page 57)
- Windows Server 2003
  - New OS Installation (page 58)
  - Existing System (page 59)
  - Confirming Driver Installation (page 59)
- Red Hat Linux
  - New OS Installation (page 60)
  - Existing System (page 60)
- SuSE Linux
  - New OS Installation (page 61)
  - Existing System (page 61)

Following are installation procedures for the SuperTrak drivers for Windows, and Linux included on the software CD.

Download the latest drivers from the Promise Support Website.

The software CD also includes source code files for compiling your own Linux drivers. Source code files begin with the letters *SRC*.

Important

If you are using a Linux distribution for which there are no compiled drivers, please access the Promise Knowledge Base and call up **Article 10029**.

Driver Installation Media

Windows

If your Windows PC does not have a floppy drive, copy the driver file to a CD or a USB stick, whichever your PC supports.

To prepare a driver diskette, CD, or USB stick for Windows:

1. Insert the software CD into your CD-ROM drive.
2. Click the **Driver** button.
3. Click the **Driver for Windows** button.
4. Click the button for your Windows system:
   - XP – **Windows SCSIPort Driver**
   - All other versions – **Windows STORPort Driver**
5. Insert a blank diskette, a writable CD, or attach a USB memory stick to your PC.
6. Copy the driver file to the diskette, CD, or USB stick.

   Check the driver's ReadMe file for important information.

Linux

Choose the medium that works for your system. If your Linux PC does not have a floppy drive, copy the driver file to a CD or a USB stick, whichever your PC supports.

To prepare a driver diskette, CD, or USB stick for Linux:

1. Insert the software CD into your CD-ROM drive.
2. Click the **Driver** button.
3. Click the button for your OS:
   - **Driver for RedHat**
   - **Driver for SUSE**
4. Double-click the folder for your OS version.
5. Manually copy the driver **.tar.gz** file from the folder to your PC's hard drive.
6. Open a terminal window and untar the driver file. Below is an example:

   tar zxvf RH-306010003.tar.gz

7. Insert a blank diskette, a writable CD, or attach a USB memory stick to your PC.
8. Copy the driver file to the diskette, CD, or USB stick.

   Check the driver's ReadMe file for important information.

Windows Server 2008

New OS Installation

The following details the installation of the SuperTrak TX Series RAID Controller drivers while installing Windows Server 2008.

1. Start the installation: Boot from the CD-ROM.
2. When the “Where do you want to install Windows?” dialog box appears, click **Load Driver**.
3. Insert the SuperTrak driver diskette into drive A: or attach a USB memory stick with the SuperTrak driver to the USB port.
4. In the Load Driver dialog box, click the **Browse** button.
5. In the Browse for Folder dialog box, click the diskette or USB stick, then click the **OK** button.
6. In the “Select the driver to be installed” dialog box, highlight *Promise SuperTrak TX [8650, 8658] (tm) Controller*, then click the **Next** button.
7. When the “Where do you want to install Windows?” dialog box appears again, in the list of Disks, highlight the Disk representing your logical drive (the Disk with unallocated space), then click the **Next** button.
8. Continue the Windows installation.

Existing System

After installing the SuperTrak TX Series RAID Controller card and rebooting your system, Windows Server 2008 setup will show a “Found New Hardware” dialog box.

1. Choose the **Locate and install driver software** option and click the **Next** button.

   The “Found New Hardware – RAID Controller” dialog box displays the message: “Allow Windows to search online for driver software for your RAID Controller?”

2. Choose the **Don’t search online** option.

   The “Found New Hardware – RAID Controller” dialog box displays the message: “Insert the disc that came with your RAID Controller.”

3. Insert the driver diskette into the floppy drive and click the **Next** button.

   Windows loads the driver and displays the “Found New Hardware” dialog box with message: “Windows has finished installing the driver software for this device *Promise SuperTrak TX [8650, 8658] (tm) Controller*.”

4. Click the **Close** button to finish driver installation.

Confirming Driver Installation

1. Right-click the My Computer icon and choose *Manage* from the popup menu.
2. From the left panel, choose *Device Manager*.
3. Click the **+** in front of Storage controllers. “Promise SuperTrak TX [8650, 8658] (tm) Controller” and “Promise Raid Console” should appear.

Windows Server 2003

New OS Installation

The following details the installation of the SuperTrak TX Series RAID Controller drivers while installing Windows Server 2003.

1. Start the installation:
   - Floppy Install: Boot the computer with the Windows Server 2003 installation diskettes.
   - CD-ROM Install: Boot from the CD-ROM. Press F6 after the message “Press F6 if you need to install third party SCSI or RAID driver” appears.
2. When the Windows Server 2003 Setup window is generated, press S to specify an Additional Device(s).
3. Insert the SuperTrak driver diskette into drive A: and press Enter.
4. Choose *Promise SuperTrak TX [8650, 8658] (tm) Controller* from the list that appears on screen, and then press the Enter.
5. The Windows Server 2003 Setup screen will appear again saying “Setup will load support for the following mass storage devices:” The list will include “Promise SuperTrak TX [8650, 8658] (tm) Controller”.

   NOTE: If there are any additional devices to be installed, specify them now. When all devices are specified, continue to the next step.
6. From the Windows Server 2003 Setup screen, press the Enter. Setup will now load all device files and then continue the Windows Server 2003 installation.

Existing System

After installing the SuperTrak TX Series RAID Controller card and rebooting your system, Windows Server 2003 setup will show a “Found New Hardware” dialog box. Under Windows 2003, “RAID Controller” will be displayed.

1. Insert the SuperTrak driver diskette into the A:\ drive.
2. Choose *Install the software automatically* and press the Enter key.
3. If using a driver that has not been digitally signed by Microsoft, you will be asked if you want to continue the installation. Click **Continue anyway**.
4. When the New Hardware Wizard has finished installing the SuperTrak driver, click **Finish**.

Confirming Driver Installation

1. Right-click the My Computer icon and choose *Manage* from the popup menu.
2. From the left panel, choose *Device Manager*.
3. Click the **+** in front of SCSI and RAID controllers. “Promise SuperTrak TX [8650, 8658] (tm) Controller” and “Promise Raid Console” should appear.

Red Hat Linux

New OS Installation

1. Start the RedHat Linux Installation by booting from the install CD.
2. At the “Welcome to Red Hat Linux...” installation screen, a prompt labeled **boot:** will appear at the bottom of the screen. Type **linux dd** and press Enter.
3. When the Installer asks, “Do you have a driver disk?” click **Yes**.
4. At the “Insert your driver disk and press OK to continue,” click **OK**.

   At the Devices dialog box, insert the driver diskette or CD, or attach the USB stick and click **OK**.
5. Continue with the installation normally.

Note: Check the readme file, included with the downloaded driver files, for instructions on installing the RAID Console.

Note: The RHEL 5 kernel includes a SuperTrak driver.

Existing System

1. Insert the driver diskette or CD, or attach the USB stick.
2. Log in as *root*.
3. Type **mount -r /dev/fd0 /mnt/floppy**.

   Change this command as needed for a CD or USB stick.
4. Type **cd /mnt/floppy**

   Change this command as needed for a CD or USB stick.
5. Type **sh ./install**.
6. When the Installer asks, “You are installing a driver on an existing OS. Is it true (y/n)?” press Y, then press Enter.
7. Type **cd; umount /mnt/floppy**.

   Change this command as needed for a CD or USB stick.
8. Remove the driver diskette, CD, or USB stick.
9. Type **reboot** to restart the system.

SuSE Linux

New OS Installation

1. Start the SuSE Linux Installation by booting from the install CD.
2. As the system boots, press F5 for the driver diskette, CD, or USB stick.
3. Choose the *Yes* option.
4. Move the cursor to highlight the *Installation – ACPI Disabled* option, then press Enter.
5. When the Driver Update Menu pops up, choose your *driver diskette*, *CD*, or *USB stick*.

   Then click **OK** and click **Back** to return to the installer.
6. Follow the on-screen prompts to complete the installation.

Existing System

1. Insert the driver diskette or CD, or attach the USB stick.
2. Log in as *root*.
3. Type **mount /dev/fd0 /media/floppy**.

   Change this command as needed for a CD or USB stick.
4. Type **cd /media/floppy**

   Change this command as needed for a CD or USB stick.
5. Type **sh ./install**.
6. Type **cd; umount /media/floppy**.

   Change this command as needed for a CD or USB stick.
7. Remove the driver diskette, CD, or USB stick.
8. Type **reboot** to restart the system.

Chapter 4: Management with SuperBuild™

- SuperTrak BIOS (below)
- Accessing the Main Menu (page 66)
- Viewing Controller Information (page 67)
- Managing Physical Drives (page 68)
- Managing Disk Arrays (page 70)
- Managing Logical Drives (page 73)
- Managing Spare Drives (page 77)
- Using the Miscellaneous Menu (page 80)

SuperTrak BIOS

This section explains the information that you can obtain from the SuperTrak BIOS.

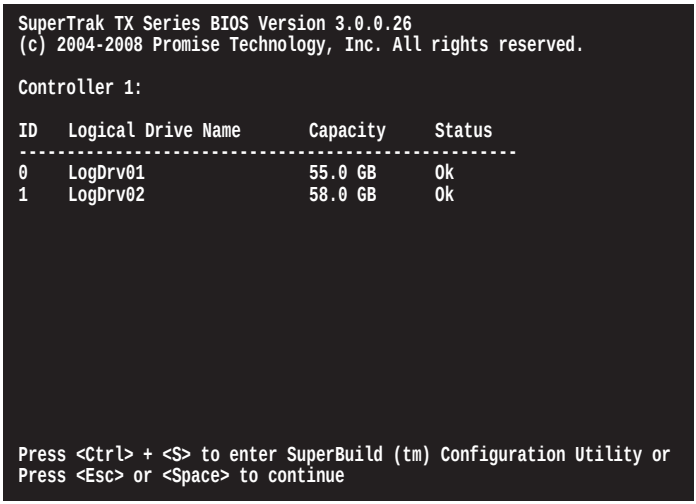
When the SuperTrak BIOS loads during boot up, the BIOS displays pertinent information about the RAID logical drives. At this point, press Ctrl-S to enter the SuperBuild Configuration Utility.

The SuperTrak BIOS screen displays the following information about your logical drives:

- **ID** – A number beginning with zero, assigned by the controller.
- **Name** – The name you assigned when you created the logical drive.
- **Capacity** – The number of physical drives attached to this controller.
- **Status** – OK, Critical, or Offline.

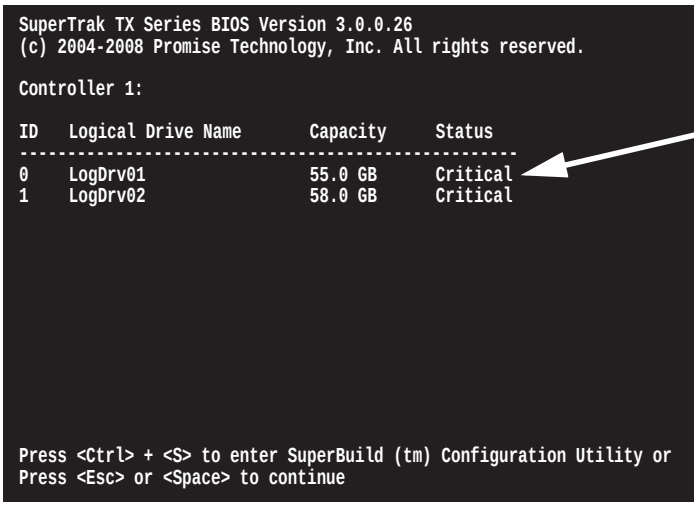
See Figure 1.

Figure 1. SuperTrak BIOS screen


SuperTrak TX Series BIOS Version 3.0.0.26
(c) 2004-2008 Promise Technology, Inc. All rights reserved.
Controller 1:
ID Logical Drive Name Capacity Status
0 LogDrv01 55.0 GB Ok
1 LogDrv02 58.0 GB Ok
Press <Ctrl> + <S> to enter SuperBuild (tm) Configuration Utility or
Press <Esc> or <Space> to continue

If the SuperBuild BIOS detects a *Critical* logical drive, the BIOS reports the condition.

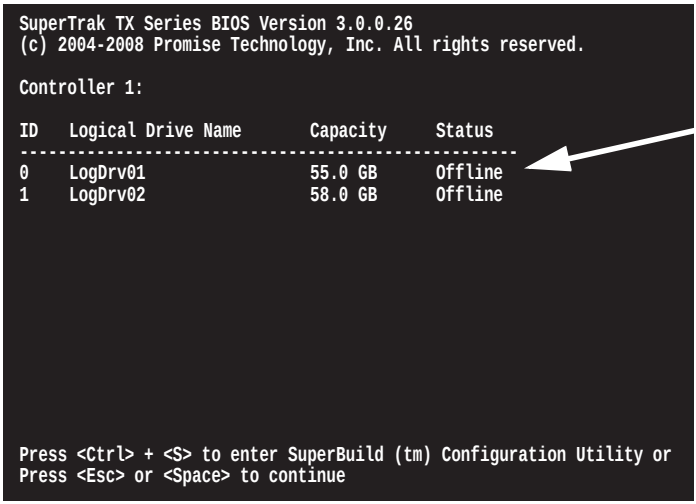
Figure 2. SuperTrak BIOS screen, logical drive critical


SuperTrak TX Series BIOS Version 3.0.0.26
(c) 2004-2008 Promise Technology, Inc. All rights reserved.
Controller 1:
ID Logical Drive Name Capacity Status
0 LogDrv01 55.0 GB Critical
1 LogDrv02 58.0 GB Critical
Press <Ctrl> + <S> to enter SuperBuild (tm) Configuration Utility or
Press <Esc> or <Space> to continue

See “Chapter 8: Troubleshooting” on page 183 for information about rebuilding a critical logical drive.

If the SuperTrak BIOS detects an *Offline* logical drive, the BIOS reports the condition.

Figure 3. SuperTrak BIOS screen, logical drive offline

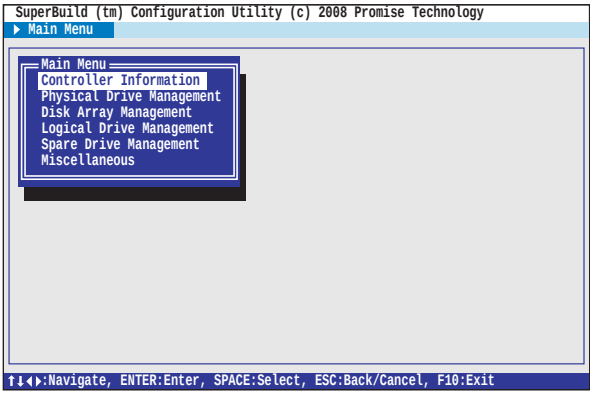

SuperTrak TX Series BIOS Version 3.0.0.26
(c) 2004-2008 Promise Technology, Inc. All rights reserved.
Controller 1:
ID Logical Drive Name Capacity Status
0 LogDrv01 55.0 GB Offline
1 LogDrv02 58.0 GB Offline
Press <Ctrl> + <S> to enter SuperBuild (tm) Configuration Utility or
Press <Esc> or <Space> to continue

See “Chapter 8: Troubleshooting” on page 183 for information about restoring an offline logical drive.

Accessing the Main Menu

The opening screen of the SuperBuild utility is the Main Menu.

Figure 4. SuperBuild Main Menu



The Main Menu (above) has six options:

- **Controller Information** – Vendor name, Controller model, Single Image version number, Firmware version number, and BIOS version number
- **Physical Drive Management** – A list of physical drives attached to the SuperTrak controller, their ID (enclosure, slot, and LUN) numbers, model numbers, capacity, and status
- **Disk Array Management** – A list of disk arrays attached to the SuperTrak controller, plus create and delete disk array functions
- **Logical Drive Management** – A list of logical drives, plus create and delete logical drive functions
- **Spare Drive Management**– A list of spare drives, plus create and delete spare drive functions
- **Miscellaneous** – Settings for SAS drive LEDs, global or aggregate LEDs, SGPIO backplane, the buzzer, and PCI subclass

Viewing Controller Information

The SuperBuild utility displays information about the selected SuperTrak TX controller.

1. In the Main Menu, highlight *Controller Information* and press Enter.

   The information includes:

   Vendor – Promise Technology, Inc.

   Model – SuperTrak TX8650 and TX8658

   Single Image Ver – The version number of the image used to update the firmware on the SuperTrak TX controller.

   Firmware Version – The version number of the firmware currently installed on the SuperTrak TX controller.

   BIOS Version – The version number of the BIOS currently installed on the SuperTrak TX controller.

2. Highlight *Return to Previous Menu* and press Enter.

Managing Physical Drives

Physical drive management includes these functions:

- Viewing Physical Drives (page 68)
- Viewing Physical Drive Information (page 68)
- Configuring Physical Drives (page 69)
- Managing Physical Drive Problems (page 69)

Viewing Physical Drives

To view physical drives:

1. In the Main Menu, highlight *Physical Drive Management* and press Enter.

   The information includes:

   ID – The channel number of the SuperTrak controller to which the physical drive is attached.

   Model Name – The physical drive manufacturer's model name for the drive.

   Capacity – Data capacity of the physical drive.

   Status – OK.
2. Highlight *Return to Previous Menu* and press Enter.

Viewing Physical Drive Information

The SuperBuild utility displays information about the physical (disk) drives attached to the SuperTrak controller.

1. In the Main Menu, highlight *Physical Drive Management* and press Enter.
2. Highlight the physical drive you want to see and press Enter.

   The Physical Drive Information screen displays:

   ID – The channel number of the SuperTrak controller to which this physical drive is attached.

   Model Name – The drive manufacturer's model name.

   Serial Number – The drive manufacturer's serial number.

   Firmware Version – The drive's firmware version number.

   Drive Interface – SAS or SATA, 3.0 or 1.5 Gb/s

   Capacity – Data capacity of the physical drive in GB.

   Location – Direct attach refers to the Host PC. Slot refers to the channel number of the SuperTrak controller.

   Configuration – Free Disk, Disk group, Spare group, or Bypass Mode.

   Status – OK.
3. Highlight *Return to Previous Menu* and press Enter.

Note

You can configure up to 32 drives for RAID Mode.
Any number of drives greater than 32 configured for RAID Mode will become either Stale or Bypass Mode.

Configuring Physical Drives

Physical drives can be configured for one of two modes:

- **RAID Mode** – For use in a disk array or as a spare drive. This is the default setting. An unassigned drive is shown as a Free Disk
- **Bypass Mode** – For use as an individual drive attached to the Host PC, similar to a JBOD drive

Warning

When you change a physical drive's configuration, you will lose all data on the drive.

If the physical drive belonged to a disk array, you will lose the disk array, logical drives, and all data they contained.

Be sure to backup any important data before you change drive configuration!

To configure a physical drive:

1. In the Main Menu, highlight *Physical Drive Management* and press Enter.
2. Highlight the physical drive whose configuration you want to change and press Enter.
3. Highlight *Config Disk for Bypass Mode* or *Config Disk for RAID Mode* and press Enter.
4. Press Y to confirm drive configuration.

   The selected drive is reconfigured.

Managing Physical Drive Problems

Physical drives can develop problems that make them unsuitable for service in a logical drive. See “Chapter 8: Troubleshooting” on page 183 for corrective action.

Managing Disk Arrays

Disk array management includes these functions:

- Viewing Disk Arrays (page 70)
- Viewing Disk Array Information (page 70)
- Creating a Disk Array (page 71)
- Rebuilding a Disk Array (page 71)
- Rebuilding a Disk Array (page 71)
- Deleting a Disk Array (page 72)

Viewing Disk Arrays

The SuperBuild utility displays information about the disk arrays managed by the SuperTrak controller.

1. In the Main Menu, highlight *Disk Array Management* and press Enter.

   The information includes:

   ID – The consecutive number of the disk array in the order it was created, beginning with 0.

   Capacity – Data capacity of the disk array in GB.

   Status – OK is normal. Can also show Critical or Incomplete.
2. Highlight *Return to Previous Menu* and press Enter.

Viewing Disk Array Information

To view disk array information:

1. In the Main Menu, highlight *Disk Array Management* and press Enter.

   The Disk Array Management screen displays.
2. Highlight the Disk Array you want to see and press Enter.

   The Disk Array Info and Setting screen displays. The information includes:

   Disk Array ID – The consecutive number of the disk array in the order it was created, beginning with 0

   Capacity (Configurable) – Usable data capacity of the disk array in GB

   Capacity (Free) – Total data capacity of the disk array in GB

   Number of Physical Drives – Number of physical drives in this disk array

   Number of Logical Drives – Number of logical drives in this disk array

   Status – OK is normal. Can also show Critical or Incomplete.
3. Highlight *Physical Drives in the Disk Array* and press Enter.

The following information displays:

ID – The enclosure, slot, and LUN numbers of the physical drive

Model Name – The physical drive manufacturer's model name for the drive

Capacity – Data capacity of the physical drive in GB

Status – OK is normal. Can also show Critical or Incomplete.

4. Highlight *Logical Drives in the Disk Array* and press Enter.

   The following information displays:

   ID – The consecutive number of the logical drive in the order it was created, beginning with 0

   Logical Drive Name – The user-assigned name for the logical drive

   Capacity – Data capacity of the logical drive in GB

   Status – OK is normal. Can also show Critical or Incomplete.

5. Highlight *Return to Previous Menu* and press Enter.

Creating a Disk Array

1. In the Main Menu, highlight *Disk Array Management* and press Enter.

   The Disk Array Management screen displays.

2. Highlight *Create Disk Array* and press Enter.

   The Create Disk Array screen displays.

3. Press the arrow keys to highlight the physical drives you want to add to this disk array. Then press the spacebar to select the physical drives.

   An asterisk (*) appears at the left of each selected physical drive.

4. Highlight *Save Disk Array* and press Enter.

   The new disk array appears under Disk Array Management. If you have more physical drives available, you can create additional disk arrays following the same procedure.

   After you have created your disk arrays, Your next action is to create one or more logical drives. See “Creating a Logical Drive” on page 74.

Rebuilding a Disk Array

See “Chapter 8: Troubleshooting” on page 183.

Deleting a Disk Array

Warning

When you delete a disk array, you delete the logical drives and all of the data on them. Backup any important data before you delete!

To delete a disk array:

1. In the Main Menu, highlight *Disk Array Management* and press Enter.

   The Disk Array Management screen displays.

2. Highlight the disk array you want to delete and press the spacebar to mark the disk array.

   An asterisk (*) appears at the left of the selected disk array.

3. Highlight *Delete Selected Disk Arrays* and press Enter.
4. Press Y to confirm disk array deletion.

   The selected disk array is removed from the list.

Managing Logical Drives

Logical drive management includes these functions:

- Viewing Logical Drives (page 73)
- Viewing Logical Drive Information (page 73)
- Creating a Logical Drive (page 74)
- Initializing a Logical Drive (page 75)
- Changing Logical Drive Settings (page 76)
- Deleting a Logical Drive (page 76)

Note

For an explanation of the logical drive concepts and the choices you can make when you create your logical drive, see “Chapter 7: Technology Background” on page 167.

For information about logical drive problems, see “Chapter 8: Troubleshooting” on page 183.

Viewing Logical Drives

To view your logical drives:

1. In the Main Menu, highlight *Logical Drive Management* and press Enter.

   The Logical Drive Management screen displays the following information:

   ID – The consecutive number of the logical drive in the order it was created, beginning with 0

   Logical Drive Name – The user-assigned name for the logical drive

   Capacity – Data capacity of the logical drive in GB

   Status – OK is normal. Can also show Critical or Offline.
2. Highlight *Return to Previous Menu* and press Enter.

Viewing Logical Drive Information

To view logical drive information:

1. In the Main Menu, highlight *Logical Drive Management* and press Enter.

   The Logical Drive Management screen displays.
2. Highlight the logical drive you want to see and press Enter.

   The Logical Drive Info and Setting screen displays. The information includes:

   Logical Drive ID – The consecutive number of the logical drive in the order it was created, beginning with 0.

   Logical Drive Name – You can change this setting.

Capacity – Data capacity of the logical drive in GB

RAID Level – Chosen when the logical drive was created.

Stripe Size – Chosen when the logical drive was created.

Sector Size – Chosen when the logical drive was created.

Disk Array ID – Consecutive number of the disk array to which this logical drive belongs

Status – OK is normal. Can also show Critical or Offline.

3. Highlight *Return to Previous Menu* and press Enter.

Creating a Logical Drive

You must create a disk array before you can create a logical drive. See “Creating a Disk Array” on page 71.

To create a logical drive:

1. In the Main Menu, highlight *Logical Drive Management* and press Enter.

   The Logical Drive Management screen displays.

2. Highlight *Create Logical Drive* and press Enter.

   The Create Logical Drive Step 1/2 screen appears.

3. Press the arrow keys to highlight a disk array. Then press the spacebar to select the disk array.

   An asterisk (*) appears at the left of the selected disk array.

   Highlight *Next Step* and press Enter.

   The Create Logical Drive Step 2/2 screen displays.

4. Press the arrow keys to highlight *Logical Drive Name*. Type a name for your logical drive and press Enter.

5. Optional. You can change any of the following parameters or use the default settings.

   - To change the RAID Level, highlight *RAID Level* and press Enter.

     In the popup menu, highlight your choice of RAID Level and press Enter.

     The available RAID Levels depend on the number of physical drives you selected for your disk array.

   - To use less than the full physical drive capacity for this logical drive, highlight *Capacity* and type the new capacity in GB to allocate to this logical drive.

     Later, you can assign the unused capacity to additional logical drives.

   - To change the Stripe Size, highlight *Stripe Size* and press Enter.

     Highlight your choice of *64 KB* or *128 KB* and press Enter.

- To change the Sector Size, highlight *Sector Size* and press Enter.

  Use the default 512 Bytes. Only exceptions are logical drives larger than 2 TB on Windows XP 32-bit. See page 178 for more information.

6. Highlight *Save Configuration* and press Enter.

   At this point you can create additional logical drives, if there is space remaining on your disk arrays. To create another logical drive, repeat steps 2 though 6 above.

7. Press the F10 key to exit the SuperBuild utility and press Y to confirm and restart the computer.

   Do not press the Ctrl-Alt-Del keys. Do not press the Esc key.

Important

You must be partition and format your new logical drive before you can use it. Use the same method of partitioning and formatting a logical drive as you would any other fixed disk added to your computer system.

Initializing a Logical Drive

Promise recommends that you Initialize your logical drives immediately after you create them. Initialization sets all data bits in the logical drive to zero, removing any residual data left behind from earlier configurations. You can also perform an Initialization on an existing logical drive.

Warning

When you initialize a logical drive, you delete all data on the logical drive. Backup any important data before you initialize!

1. In the Main Menu, highlight *Logical Drive Management* and press Enter.

   The Logical Drive Management screen displays.

2. Highlight the logical drive you want to initialize and press Enter.
3. Highlight *Initialization Start* and press Enter.

   A message appears at the bottom of the screen.

4. Press Y to confirm logical drive Initialization.

   The Initialization takes only a moment.

Changing Logical Drive Settings

The only logical drive setting you can change is the name. To change logical drive's name:

1. In the Main Menu, highlight *Logical Drive Management* and press Enter.

   The Logical Drive Management screen displays.

2. Highlight the logical drive whose settings you want to change and press Enter.

   The Logical Drive Info and Setting screen displays.

3. Press the arrow keys to highlight the name.
4. Press the backspace or delete keys to remove the characters. Then type new characters.
5. Highlight *Save Setting* and press Enter.

   The change happens immediately.

Deleting a Logical Drive

Warning

When you delete a logical drive, you delete all data on the logical drive. Backup any important data before you delete!

To delete a logical drive:

1. In the Main Menu, highlight *Logical Drive Management* and press Enter.

   The Logical Drive Management screen displays.

2. Highlight the logical drive you want to delete and press the spacebar to mark the logical drive.

   An asterisk (*) appears at the left of the selected logical drive.

3. Highlight *Delete Selected Logical Drives* and press Enter.
4. Press Y to confirm logical drive deletion.

   The selected logical drive is removed from the list.

Managing Spare Drives

Spare drive management includes these functions:

- Viewing Spare Drives (page 77)
- Viewing Spare Drive Information (page 77)
- Creating a Spare Drive (page 78)
- Changing Spare Drive Settings (page 78)
- Deleting a Spare Drive (page 79)

Viewing Spare Drives

To view your spare drives:

1. In the Main Menu, highlight *Spare Drive Management* and press Enter.

   ID – The consecutive number of the spare drive in the order it was created, beginning with 0

   Model Name – The physical drive manufacturer's model name

   Capacity – Data capacity of the physical drive in GB

   Status – OK is normal. Can also show Critical or Offline.
2. Highlight *Return to Previous Menu* and press Enter.

Viewing Spare Drive Information

To view spare drive information:

1. In the Main Menu, highlight *Spare Drive Management* and press Enter.

   The Spare Drive Management screen displays.
2. Highlight the spare drive you want to see and press Enter.

   The Spare Drive Info and Setting screen displays. The information includes:

   Physical Drive ID – The channel number of the SuperTrak controller to which the physical drive is attached.

   Spare Type – Global or Dedicated.
3. Highlight *Return to Previous Menu* and press Enter.

Creating a Spare Drive

For a physical drive to qualify as a spare, the drive must be:

- **Unconfigured** – Not part of an array
- **Functional** – Showing OK status
- **Big Enough** – Same capacity or greater than the smallest drive in your array

To create a spare drive:

1. In the Main Menu, highlight *Spare Drive Management* and press Enter.

   The Spare Drive Management screen displays.
2. Highlight *Assign Spare Drive* and press Enter.

   The Assign Spare Drive Step 1/2 screen appears.
3. Press the arrow keys to highlight a physical drive. Then press the spacebar to select the physical drive.

   An asterisk (*) appears at the left of the selected physical drive.

   Highlight *Next Step* and press Enter.

   The Assign Spare Drive 2/2 screen displays.
4. Press the arrow keys to highlight *Spare Type*, then choose one:
   - **Global** – Can be used by any disk array.
   - **Dedicated** – Can only be used by the assigned disk array.
5. Optional. If you chose *Dedicated* in step 4, press the arrow keys to highlight a disk array. Then press the spacebar to select the disk array.

   An asterisk (*) appears at the left of the selected disk array.
6. Highlight *Save Configuration* and press Enter.

Changing Spare Drive Settings

You can change a spare drive's revertibility and type. To change spare drive settings:

1. In the Main Menu, highlight *Spare Drive Management* and press Enter.

   The Spare Drive Management screen displays.
2. Highlight the spare drive whose settings you want to change and press Enter.

   The Spare Drive Info and Setting screen displays.
3. Press the arrow keys to highlight *Spare Type*, then choose one:
   - **Global** – Can be used by any disk array.
   - **Dedicated** – Can only be used by the assigned disk array.
4. Optional. If you chose *Dedicated* in step 3, press the arrow keys to highlight a disk array. Then press the spacebar to select the disk array.

An asterisk (*) appears at the left of the selected disk array.

5. Highlight *Save Setting* and press Enter.

   The changes happen immediately.

Deleting a Spare Drive

To delete a spare drive:

1. In the Main Menu, highlight *Spare Drive Management* and press Enter.

   The Spare Drive Management screen displays.

2. Highlight the spare drive you want to delete and press the spacebar to mark the spare drive.

   An asterisk (*) appears at the left of the selected spare drive.

3. Highlight *Delete Selected Spare Drives* and press Enter.
4. Press Y to confirm spare drive deletion.

   The selected spare drive is removed from the list.

Using the Miscellaneous Menu

The Miscellaneous menu enables three useful functions on SuperTrak:

- Making the SAS Ready LED Setting (page 80)
- Making the SGPIO Backplane Setting (page 80)
- Working with the Buzzer (page 81)

Making the SAS Ready LED Setting

The LEDs for SAS disk drives stay on continuously to show Ready status, except when the drive is processing a command. This function enables you to turn the LEDs off.

To turn the SAS drive LEDs off:

1. In the Main Menu, highlight *Miscellaneous* and press Enter.
2. Highlight *SAS READY LED* and press Enter.
3. Highlight your choice and press Enter.
    - On – SAS drive LEDs on continuously
    - Off – SAS drive LEDs off

Making the SGPIO Backplane Setting

This function enables you to set your SuperTrak card to work your enclosure management controller through the SGPIO connection.

To choose your enclosure management controller setting:

1. In the Main Menu, highlight *Miscellaneous* and press Enter.
2. Highlight *SGPIO Backplane* and press Enter.
3. Highlight your choice and press Enter.
    - Generic
    - Chenbro
    - Supermicro AMI-9072
    - AIC
    - AMI918
    - Direct Led

Working with the Buzzer

The buzzer sounds to inform you that your RAID system needs attention. But the buzzer does not specify the condition. When a continuous tone sounds, there are multiple alarm patterns sounding at the same time.

When the buzzer sounds, check your disk arrays and logical drives.

To silence the buzzer for the current trigger event, you must disable it.

Also see “Chapter 8: Troubleshooting” on page 183.

Enabling or Disabling the Buzzer

To enable or disable the Buzzer:

1. In the Main Menu, highlight *Miscellaneous* and press Enter.
2. Highlight *Buzzer* and press Enter.
3. Highlight your choice and press Enter.
    - Enable
    - Disable

Chapter 5: Management with WebPAM PRO

- Logging into WebPAM PRO (page 83)
- Accessing the Interface (page 86)
- Managing Users (page 92)
- Working with Subsystem/Host Management (page 96)
- Managing Software Services (page 98)
- Managing the Host (page 102)
- Managing the Subsystem (page 103)
- Managing the Controller (page 112)
- Managing Enclosures (page 116)
- Managing Physical Drives (page 117)
- Managing Disk Arrays (page 120)
- Managing Logical Drives (page 133)
- Managing Spare Drives (page 137)
- Working with the Logical Drive Summary (page 140)

This chapter describes using WebPAM PRO to monitor and manage your RAID system. This chapter is divided into sections for major WebPAM PRO components as shown above.

Logging into WebPAM PRO

You can log into WebPAM PRO in either of two ways:

- Logging in at the Host PC (page 83)
- Logging in over the Network (page 84)

Logging in at the Host PC

At the Host PC (where the SuperTrak TX Controller is installed), to log into WebPAM PRO, do one of the following actions:

- Double-click the **WebPAM PRO** desktop icon.
- Choose *WebPAM PRO* in the Windows Programs menu or the Linux Applications menu.
- Follow the steps under “Logging in over the Network” on page 84.

Logging in over the Network

You can log into WebPAM PRO from any PC with a network connection to the Host PC (where the SuperTrak TX Controller is installed).

1. Launch your Browser.
2. In the Browser address field, type the information provided below. Then press Enter.

   If you chose External SSL Security during installation (Windows, see page 37; Linux, see page 45), use the *Secure Connection*. Otherwise, use the *Regular Connection*.

Regular Connection

- WebPAM PRO uses an HTTP connection. . . . . .http://
- Enter the Host PC's IP address. 192.168.10.228
- Enter the Port number . . . . . :8080
- Add promise to launch WebPAM PRO . . . . . /promise

Together, your entry looks like this:

http://192.168.10.228:8080/promise

Secure Connection

- WebPAM PRO uses a secure HTTP connection. . . . . .https://
- Enter the Host PC's IP address. 192.168.10.228
- Enter the Port number . . . . . :8443
- Add promise to launch WebPAM PRO . . . . . /promise

Together, your entry looks like this:

https://192.168.10.228:8443/promise

Notes

- You can enter the Host PC's network name in place of the IP address.
- If you are logging in at the Host PC, you can enter **localhost** in place of the IP address.
- Whether you select a regular or a secure connection, your login to WebPAM PRO and your user password are always secure.

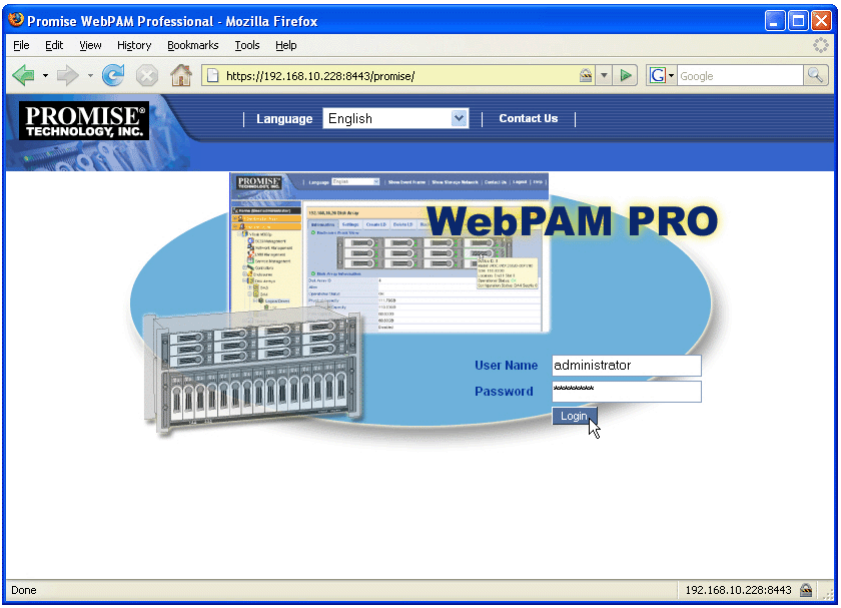
Login Screen

When the opening screen appears:

1. Type **administrator** in the User Name field.
2. Type **password** in the Password field.
3. Click the **Login** button.

   The User Name and Password are case sensitive. See Figure 1.

Figure 1. The WebPAM PRO login screen

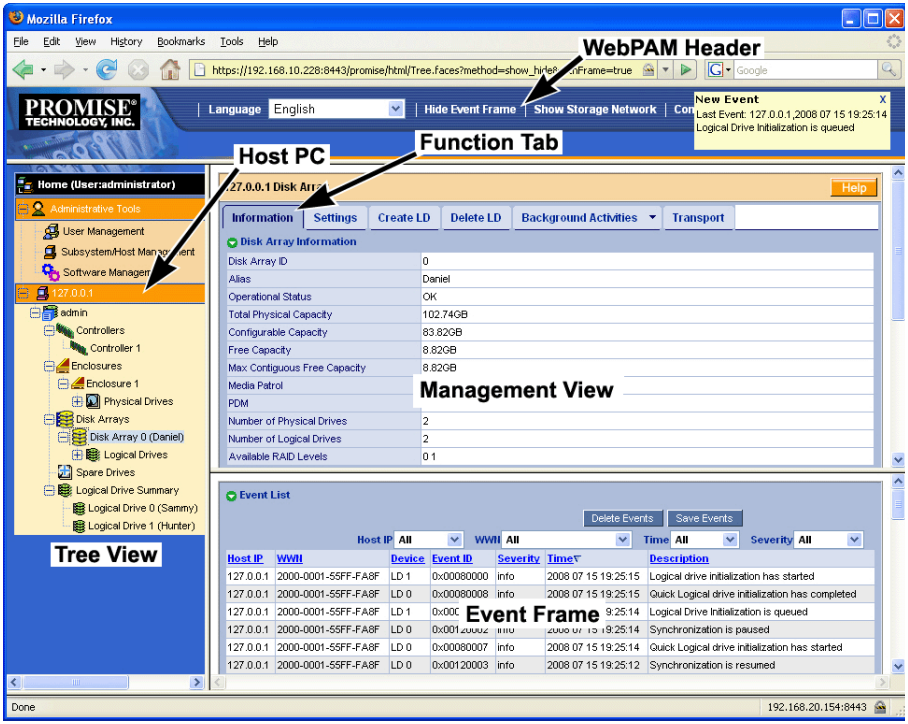


Accessing the Interface

WebPAM PRO is browser-based RAID management software with a graphic user interface. Basic user interface components and functions include:

- Using the Header (page 87)
- Using Tree View (page 87)
- Using Management View (page 88)
- Choosing a Display Language (page 89)
- Viewing the Event Frame (page 89)
- Saving the Event Frame (page 90)
- Deleting the Event Frame (page 90)
- Viewing the Storage Network (page 90)
- Logging out of WebPAM PRO (page 91)

Figure 2. WebPAM PRO interface


WebPAM Header
Function Tab
Host PC
Management View
Event Frame
Tree View
Mozilla Firefox
PROMISE TECHNOLOGY, INC.
Language
English
Hide Event Frame
Show Storage Network
New Event
Last Event: 127.0.0.1,2008 07 15 19:25:14
Logical Drive Initialization is queued
Home (User:administrator)
Administrative Tools
User Management
Software Manager
127.0.0.1
admin
Controllers
Controller 1
Enclosures
Enclosure 1
Physical Drives
Disk Arrays
Disk Array 0 (Daniel)
Logical Drives
Spare Drives
Logical Drive Summary
Logical Drive 0 (Sammy)
Logical Drive 1 (Hunter)
Help
Information
Settings
Create LD
Delete LD
Background Activities
Transport
Disk Array Information
Disk Array ID 0
Alias Daniel
Operational Status OK
Total Physical Capacity 102.74GB
Configurable Capacity 83.82GB
Free Capacity 8.82GB
Max Contiguous Free Capacity 8.82GB
Media Patrol
PDM
Number of Physical Drives 2
Number of Logical Drives 2
Available RAID Levels 0 1
Event List
Delete Events
Save Events
Host IP
WWN
Time
Severity
Host IP | WWN | Device | Event ID | Severity | Time | Description
127.0.0.1 | 2000-0001-55FF-FA8F | LD 1 | 0x00080000 | info | 2008 07 15 19:25:15 | Logical drive initialization has started
127.0.0.1 | 2000-0001-55FF-FA8F | LD 0 | 0x00080008 | info | 2008 07 15 19:25:15 | Quick Logical drive initialization has completed
127.0.0.1 | 2000-0001-55FF-FA8F | LD 1 | 0x000 | info | 9:25:14 | Logical Drive Initialization is queued
127.0.0.1 | 2000-0001-55FF-FA8F | LD 0 | 0x0012 | info | 19:25:14 | Synchronization is paused
127.0.0.1 | 2000-0001-55FF-FA8F | LD 0 | 0x00080007 | info | 2008 07 15 19:25:14 | Quick Logical drive initialization has started
127.0.0.1 | 2000-0001-55FF-FA8F | LD 0 | 0x00120003 | info | 2008 07 15 19:25:12 | Synchronization is resumed
Done
192.168.20.154:8443

There are four major parts to the WebPAM PRO interface:

- Header (see page 87)
- Tree View (see page 87)
- Management View (see page 88)
- Event Frame (see page 89)

Using the Header

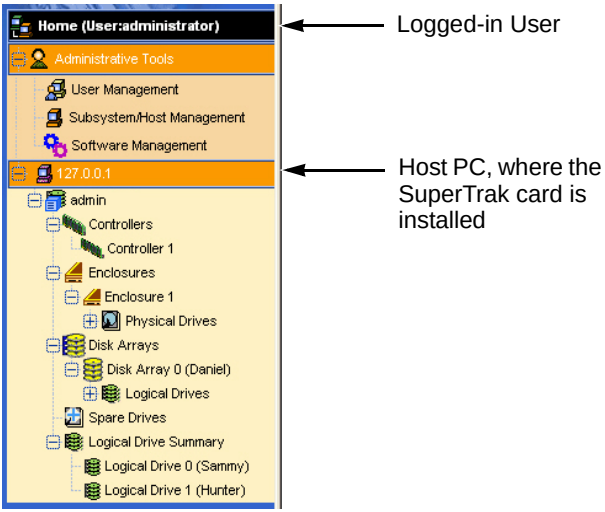
The Header contains the following items:

- **Language** – To choose a display language, see “Choosing a Display Language” on page 89.
- **Show/Hide Event Frame** – To view the Event Frame, see “Viewing the Event Frame” on page 89.
- **Show/Hide Storage Network** – To view the Storage Network, see “Viewing the Storage Network” on page 90.
- **Contact Us** – Click here for Promise Technology contact information. Or see “Contacting Technical Support” on page 199.
- **Logout** – To logout, see “Logging out of WebPAM PRO” on page 91.

Using Tree View

Tree View enables you to navigate around all components of the Host PC (where the SuperTrak controller card is installed), software management, RAID controller, enclosure, physical drives, disk arrays, logical drives, and spare drives. The figure below shows the components of Tree View.

Figure 3. WebPAM PRO Tree View



The Administrative Tools section is different for the Administrator and Super Users than for other users. The remainder of the Tree is the same for all users.

Management View displays information according to the item you choose in Tree View.

Using Management View

Management View—also referred to Management View—provides the actual user interface with the SuperTrak TX Controller card, including creation, maintenance, deletion, and monitoring of disk arrays and logical drives.

Function Tabs control specific actions and processes. This View changes depending on which item you choose in Tree View and which tab you choose in the Management View itself.

Click the **Help** button to the right of the tabs in Management View to access online help for the function that is currently displayed.

Choosing a Display Language

WebPAM PRO displays in the following languages:

- English
- Simplified Chinese
- Traditional Chinese
- French
- German
- Italian
- Japanese
- Korean
- Spanish
- Russian

To change the display language:

1. Click the **Language** dropdown menu in the Header.
2. Highlight the language you prefer.

   WebPAM PRO displays in the chosen language.

Viewing the Event Frame

To view the Event Frame, click **Show Event Frame** in the Header.

To hide the Event Frame, click **Hide Event Frame** in the Header.

The Event Frame reports all events and stores them in the WebPAM PRO folder on the hard disk drive of the Host PC.

In the event frame, events are listed and sorted by:

- **Host IP** – The IP address of the Host PC or subsystem where the event happened
- **WWN** – World Wide Number of the Host PC or subsystem where the event happened
- **Device** – Disk array, logical drive, physical drive, controller, etc.
- **Event ID** – The hexadecimal number that identifies the specific type of event
- **Severity** – See below:
  - **Information** – Information only, no action is required
  - **Warning** – User can decide whether or not action is required
  - **Minor** – Action is needed but the condition is not serious at this time
  - **Major** – Action is needed now
  - **Critical** – Action is needed now and the implications of the condition are serious
  - **Fatal** – Non-Recoverable error or failure has occurred
- **Time** – Time and date of the occurrence
- **Description** – A brief description of the event

You can also view events by clicking the Subsystems icon in Tree View, then clicking the **Event** tab in Management View.

Saving the Event Frame

This function saves a copy of the events from the Event Frame as a text file on the Host PC's hard drive.

To save the event log:

1. In the Header, click **Show Event Frame**.
2. In the Event Frame, click the **Save Events** button.
3. In the File Download dialog box, click the **Save** button.
4. In the Save dialog box, name the file, navigate to the folder where you want to save the log file, and click the **Save** button.

   The event log is saved as a text file on the Host PC's hard drive.

Deleting the Event Frame

This function deletes the events from the Event Frame and from the WebPAM PRO database. Deleting the events from this point does not affect events physically stored in the HBA's or Subsystem's RAM or NVRAM.

This function has no effect upon events reported under the Subsystem icon Events tab. See "Viewing the Runtime Event Log" on page 104 and "Viewing the NVRAM Event Log" on page 105.

To clear the event log:

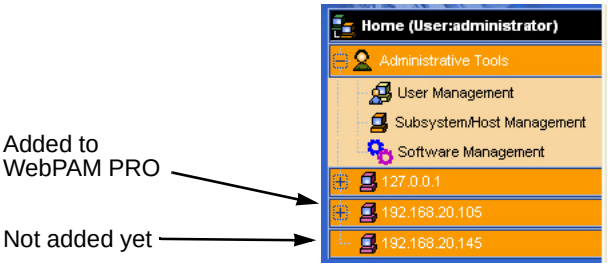
1. In the Header, click **Show Event Frame**.
2. In the Event Frame, click the **Delete Events** button.
3. In the Confirmation dialog box, type **confirm** and click the **OK** button.

Viewing the Storage Network

The Storage Network consists of all the subsystems and host PCs currently accessible on your network. Use this function to identify the subsystem or host PC you want to add.

Subsystems and host PCs already added to WebPAM PRO have a **+** icon beside them in Tree View.

Figure 4. The Storage Network appears in Tree View



To view the Storage Network, click **Show Storage Network** in the Header. All networked systems will appear in Tree View.

To hide the Storage Network, click **Hide Storage Network** in the Header. Only the networked systems you have added appear in Tree View.

See “Adding a Subsystem or Host” on page 96.

Logging out of WebPAM PRO

There are two ways to log out of WebPAM PRO:

- Close your browser window
- Click **Logout** in the WebPAM PRO Header

Figure 5. Clicking “Logout” in the Header)

Clicking **Logout** brings you back to the Login Screen. After logging out, you must enter your user name and password in order to log in again.

Managing Users

User Management includes all functions dealing with user accounts. Functions include:

- Viewing User Information (page 92)
- Making User Settings (page 92)
- Making Your Own User Settings (page 93)
- Changing a User's Password (page 93)
- Changing Your Own Password (page 93)
- Creating a User (page 94)
- Deleting a User (page 94)

Viewing User Information

The view a list of users, their status, access privileges, display name, and email address:

1. Click the Administrative Tools icon.
2. Click the User Management icon.

   The Information tab appears in Management View.

Making User Settings

To change settings of other users:

1. Log into WebPAM PRO as the Administrator or a Super User.
2. Click the Administrative Tools icon.
3. Click the User Management icon.
4. Click the **Information** tab in Management View.
5. In the list of users, click the **link** of the user whose settings you want to change.

   The Settings screen for the chosen user displays.
6. Enter or change the settings for this user.
   - Enable/disable this user
   - Display name
   - Privilege. See "List of User Privileges" on page 94
7. Click the **Submit** button.

The Administrator or Super User can change another user's password. See "Changing a User's Password" on page 93 for more information.

You can also set user privilege under Subsystem/Host Management. See “Setting User Privilege” on page 97 and “Setting User Rights” on page 102.

Making Your Own User Settings

To change your own user settings:

1. Log into WebPAM PRO under your own user name.
2. Click the Administrative Tools icon.
3. Click the User Management icon.
4. Click the **Settings** tab in Management View.
5. Enter or change the display name or mail address.
6. Click the **Submit** button.

Changing a User’s Password

To change a user’s password:

1. Log into WebPAM PRO as the Administrator or a Super User.
2. Click the Administrative Tools icon.
3. Click the User Management icon.
4. In the list of users, click the link of the user whose settings you want to change.

   The Settings screen for the chosen user displays.
5. Click the **Password** tab in Management View.
6. Enter the new password in the New Password field.
7. Enter the new password in the Retype Password field.
8. Click the **Submit** button.

Changing Your Own Password

To set or change your own password:

1. Log into WebPAM PRO under your own user name.
2. Click the Administrative Tools icon.
3. Click the User Management icon.
4. Click the **Password** tab in Management View.
5. Enter the current password in the Old Password field.

   If you do not have a password, leave this field blank.
6. Enter the new password in the New Password field.
7. Enter the new password in the Retype Password field.

8. Click the **Submit** button.

Creating a User

To create a user:

1. Log into WebPAM PRO as the Administrator or a Super User.
2. Click the Administrative Tools icon.
3. Click the User Management icon.
4. Click the **Create** tab in Management View.
5. Enter a user name in the User Name field.
6. Enter a password for this user in the New Password and Retype Password fields.

   A password is optional. If you do not assign password, tell this user to leave the password field blank when he/she logs into to WebPAM PRO. Users can set their own passwords, see “Changing Your Own Password” on page 93.
7. Check the Enabled box to enable this user on this subsystem.
8. Enter a display name in the Display Name field.

   A display name is optional but recommended.
9. Choose a privilege level from the Privilege dropdown menu.

   For definitions of each privilege level, see the List of User Privileges below.
10. Click the **Submit** button.

List of User Privileges

- **View** – Allows the user to see all status and settings but not to make any changes
- **Maintenance** – Allows the user to perform maintenance tasks including Rebuilding, Media Patrol, and Redundancy Check.
- **Power** – Allows the user to create (but not delete) disk arrays and logical drives, change RAID levels, change stripe size; change settings of components such as disk arrays, logical drives, physical drives, and the controller.
- **Super** – Allows the user full access to all functions including create and delete users and changing the settings of other users, and delete disk arrays and logical drives. The default “administrator” account is a Super User.

Deleting a User

There will always be at least one Super User account. You cannot delete the user account you used to log in. To delete a user:

1. Log into WebPAM PRO as the Administrator or a Super User.

2. Click the Administrative Tools icon.
3. Click the User Management icon.
4. Click the **Delete** tab in Management View.
5. Check the box to the left of the user you want to delete.
6. Click the **Submit** button.
7. Click **OK** in the confirmation box.

Working with Subsystem/Host Management

Subsystem/Host Management includes the following functions:

- Viewing Subsystem/Host Information (page 96)
- Adding a Subsystem or Host (page 96)
- Deleting a Subsystem or Host (page 97)
- Setting User Privilege (page 97)

Viewing Subsystem/Host Information

To view the Subsystem/Host List:

1. Click the Administrative Tools icon in Tree View.
2. Click the Subsystem/Host Management icon.

   In the Information tab, the following information appears:

   - Subsystem/Host IP address
   - Management Port IP address
   - Health – A green check mark means OK. A red X indicates a problem
   - Model of the RAID controller
   - Alias of the RAID controller
   - Firmware Version of the RAID controller
   - Interface of the RAID controller
   - World Wide Number of the RAID controller

   If a red X appears under Health, click the Health Information icon to display a breakdown showing the health of the controller, disk arrays, logical drives, spare drives, and physical drives.

Adding a Subsystem or Host

To add a subsystem/ or host PC to WebPAM PRO:

1. Log into WebPAM PRO as the Administrator or a Super User.
2. Click the Administrative Tools icon in Tree View.
3. Click the Subsystem/Host Management icon.
4. Click the **Add Subsystem/Host** tab in Management View.

5. Do one of the following actions:
   - To create an in-band connection: Type the *Host PC's* IP address into the address field.

     Choose this option for *SuperTrak*. Note that entries such as *localhost* or the Host PC's network name do not work for this function.
   - To create an out-of-band connection: Type the *Subsystem's* management port IP address into the address field.
6. Click the **Submit** button.

   The new Subsystem or Host PC is added to Tree View.

Deleting a Subsystem or Host

When you delete a subsystem or host PC, you only remove it from WebPAM PRO's list of monitored systems. This action has no effect upon the disk arrays, logical drives, or data stored on the RAID.

To delete a subsystem or host PC:

1. Log into WebPAM PRO as the Administrator or a Super User.
2. Click the Administrative Tools icon in Tree View.
3. Click the Subsystem/Host Management icon.
4. Click the **Delete Subsystem/Host** tab in Management View.
5. Check the box to the left of the subsystem or host PC you want to delete.
6. Click the **Submit** button.
7. In the confirmation box, type the word **confirm** in the field provided.
8. Click the **OK** button.

Setting User Privilege

To set user privilege:

1. Click the Administrative Tools icon in Tree View.
2. Click the Subsystem/Host Management icon.
3. click the IP address link of the Subsystem or Host you want to access.
4. Beside the name of the user whose privilege you want to change, choose the privilege level from the Privilege dropdown menu.

   For definitions of each privilege level, see "List of User Privileges" on page 94.
5. Click the **Submit** button.

You can also set user privilege under User settings. See "Making User Settings" on page 92.

Managing Software Services

Software Services include the following functions:

- Viewing Service Status (page 98)
- Changing Web Server Settings (page 98)
- Restarting the Tomcat Server (page 99)
- Setting up Email Service (page 99)
- Setting up Extended SMTP (page 100)
- Setting Event Frame Refresh Time (page 100)
- Changing CIM Client Settings (page 101)
- Changing CIM Server Settings (page 101)

Viewing Service Status

There are two software services: Web Server and Email. There are no user settings. To view the status of the software services:

1. Click the Administrative Tools icon in Tree View.
2. Click the Software Management icon.

   The service name, startup type, and current status appear under the Service tab.

Changing Web Server Settings

To change the Web Server settings:

1. Click the Administrative Tools icon in Tree View.
2. Click the Software Management icon.
3. Click the **Web Server** tab in Management View.
4. Do one of the following actions:
   - For a regular connection:

     In the HTTP Port field, type the HTTP port number.
     The default is 8080.
   - For a secure connection:

     Check the Enable SSL box.

     In the HTTPS Port field, type the HTTPS port number.
     The default is 8443.
5. In the Session Time Out field, enter a time value in minutes.

The range is 1 to 1440 minutes. 15 minutes is the default.

Session Time Out refers to the amount of time the connection remains active without any user interaction. After WebPAM PRO reaches the Time Out interval, you must log in again and begin a new session.

6. Click the **Submit** button.
7. In the confirmation box, type the word **confirm** in the field provided.
8. Click the **OK** button.

Restarting the Tomcat Server

After you change the Web Server port number, you must restart the Tomcat server.

Windows

In the Start menu, choose Programs > WebPAM PRO > Server > Restart.

Linux

1. Open a terminal window.
2. Go to the server folder.

   ```
   cd /opt/Promise/WebPAMPRO/Server
   ```

3. Run the restart command:

   ```
   sh restartPromiseWebPamPro.sh
   ```

   The system returns:

   ```
   /etc/rc.d/init.d/ exists.
   Shutting down: tomcat OK
   Starting: tomcat OK
   ```

   (Or a similar message)

Setting up Email Service

To change the Email settings:

1. Click the Administrative Tools icon in Tree View.
2. Click the Software Management icon.
3. Click the **Email** tab in Management View.
4. Enter an Email sender address (example: RAIDmaster@mycompany.com) in the field provided.
5. Enter an Email server IP address in the field provided.
6. Enter an Email subject (example: VTrak Status) in the field provided.
7. When you are done, click the **Submit** button.

Setting up Extended SMTP

To make Extended SMTP settings:

1. Click the Administrative Tools icon in Tree View.
2. Click the Software Management icon.
3. Click the **Email** tab in Management View.
4. Check the Enable ESMTP box to enable ESMTP.
   Uncheck the box to disable ESMTP.
5. Enter ESMTP user name in the field provided.
6. Enter a ESMTP password in the field provided.
7. When you are done, click the **Submit** button.

Sending A Test Email Message

Before you can send a test message, your email service must be set up as described in “Setting up Email Service” on page 99.

To send a test email message:

1. Click the Administrative Tools icon in Tree View.
2. Click the Software Management icon.
3. Click the **Email** tab in Management View.
4. Click the **Test Email** button.
   A new window opens.
5. Type the recipient's email address in the field provided.
6. Click the **Submit** button.
   WebPAM PRO sends a test email message to the address you specified.

Setting Event Frame Refresh Time

To set the refresh time for the Event Frame:

1. Click the Administrative Tools icon in Tree View.
2. Click the Software Management icon.
3. Click the **Refresh time** tab.
4. Choose a time interval from the Event Refresh Time dropdown menu.
   The choices are *15*, *30*, *60*, and *300* seconds.
5. Click the **Submit** button.

Changing CIM Client Settings

The CIM client is part of the WebPAM PRO Utility Server. The Utility Server can be installed on any PC on the network. Only one CIM client and Utility Server installation is required.

The CIM client works with CIM server. The CIM server is part of the WebPAMPRO Agent. The Agent must be installed on every host PC where the HBA RAID controller is installed to enable management over a network.

Under most conditions, there is no need to change CIM settings.

To change settings for the CIM client:

1. Click the Administrative Tools icon in Tree View.
2. Click the Software Management icon.
3. Click the **CIM Settings** tab.
4. Type the user name in the CIM User name field.
   The default name is “cim”.
5. Type a password into the CIM User Password field.
   The default password is “password”.
6. Click the **Submit** button.

Important

If you change CIM client settings, you must make matching CIM server settings on ALL Host PCs, otherwise WebPAM PRO will be unable to monitor them.

Be sure you change the CIM server settings on ALL of your Host PCs to match the CIM client settings.

Changing CIM Server Settings

To change settings for the CIM server:

1. On the Host PC, access the WebPAM PRO agent folder.
   - **Windows** – C:/Program Files/Promise/WebPAMPRO/Agent/bin
   - **Linux** – /opt/Promise/WebPAMPRO/Agent/bin
2. Open a command-line utility, type **cimuser --help** and press Enter.
3. Follow the instructions on the screen.

Managing the Host

The Host is designated by its IP address:127.0.0.1. Host functions include:

- Viewing Host Information (page 102)
- Setting User Rights (page 102)
- Refreshing the WebPAM PRO Screen (page 102)

Viewing Host Information

To view Host information, click the 127.0.0.1 icon in Tree View. In the Information tab, the following information appears:

- Management Port IP address (refers to the Host PC)
- Model of the RAID controller
- Alias of the RAID controller
- Firmware Version of the RAID controller
- Interface of the RAID controller
- World Wide Number of the RAID controller

Setting User Rights

User rights is the same function as user privilege. To set user rights:

1. Click the 127.0.0.1 icon in Tree View.
2. Click the **User Rights** tab.
3. Beside the name of the user whose privilege you want to change, choose the privilege level from the Privilege dropdown menu.

   For definitions of each privilege level, see “List of User Privileges” on page 94.
4. Click the **Submit** button.

You can also set user privilege under User settings. See “Making User Settings” on page 92

Refreshing the WebPAM PRO Screen

Unlike clicking browser’s refresh button, this function calls new information from the RAID controller’s firmware to update the screen. To refresh the screen:

1. Click the 127.0.0.1 icon in Tree View.
2. Click the **Refresh** tab.
3. Click the **Submit** button.
4. Click the **OK** button in the confirmation box.

Managing the Subsystem

Subsystem functions include:

- Viewing Subsystem Information (page 103)
- Checking Subsystem Health (page 103)
- Viewing the Runtime Event Log (page 104)
- Saving the Runtime Event Log (page 104)
- Clearing the Runtime Event Log (page 105)
- Viewing the NVRAM Event Log (page 105)
- Saving the NVRAM Event Log (page 105)
- Clearing the NVRAM Event Log (page 106)
- Viewing Current Background Activities (page 106)
- Making Background Activity Settings (page 107)
- Running Background Activities (page 108)
- Running Media Patrol (page 108)
- Viewing Scheduled Activities (page 108)
- Scheduling an Activity (page 108)
- Deleting a Scheduled Activity (page 110)
- Viewing System Configuration (page 110)

Viewing Subsystem Information

To view information about a subsystem, click the Subsystem icon in Tree View. Management View displays the subsystem information.

To view information about the Host PC, users, controllers, schedules, activities, physical drives, disk arrays, and logical drives, see “Viewing System Configuration” on page 110.

Checking Subsystem Health

1. In Tree View, click the Subsystem icon.
2. In Management View, click the **Health** tab.

   The health or status of following items is displayed:

   - Controller
   - Disk Array
   - Logical Drive
   - Spare Drive
   - Physical Drive

If any item reports other than “OK” click that item in the Tree to investigate the cause of the problem.

Viewing the Runtime Event Log

Runtime Events lists information about all events recorded since the system was started. Runtime events are stored in RAM on the RAID controller. These events are cleared when you reboot your system.

To view runtime events:

1. In Tree View, click the Subsystem icon.
2. From the dropdown menu on the Event tab, choose *Runtime Events*.

   The events are listed from newest at the top of the list to oldest at the bottom.

Severity Definitions

Each event is marked with a level of severity.

- **Information** – Information only, no action is required
- **Warning** – User can decide whether or not action is required
- **Minor** – Action is needed but the condition is not serious at this time
- **Major** – Action is needed now
- **Critical** – Action is needed now and the implications of the condition are serious
- **Fatal** – Non-Recoverable error or failure has occurred

Saving the Runtime Event Log

This function saves a copy of the runtime event log as a text file on the Host PC’s hard drive.

To save the runtime event log:

1. In Tree View, click the Subsystem icon.
2. From the dropdown menu on the Events tab, choose *Runtime Events*.
3. At the bottom of the window, click the **Save Event Log** button.
4. In the File Download dialog box, click the **Save** button.
5. In the Save dialog box, name the file, navigate to the folder where you want to save the log file, and click the **Save** button.

   A text file of the event log is saved to the Host PC’s hard drive.

Clearing the Runtime Event Log

This function clears the events from the runtime event log screen and from the RAM on the RAID controller. This function has no effect upon events reported in the WebPAM PRO Event Frame. “Viewing the Event Frame” on page 89.

To clear the runtime event log:

1. In Tree View, click the Subsystem icon.
2. From the dropdown menu on the Events tab, choose *Runtime Events*.
3. At the bottom of the window, click the **Clear Event Log** button.
4. In the Confirmation dialog box, type **confirm** and click the **OK** button.

   All events are cleared from the screen and the RAID controller’s RAM.

Viewing the NVRAM Event Log

NVRAM Events lists information about the most recent important or critical events. NVRAM events are stored in non-volatile memory on the RAID controller. This information persists even if you reboot your system. Not all products support this feature.

To view runtime events:

1. In Tree View, click the Subsystem icon.
2. From the dropdown menu on the Events tab, choose *Subsystem Events in NVRAM*.

   The events are listed from newest at the top of the list to oldest at the bottom.

Severity Definitions

Each event is marked with a level of severity.

- **Information** – Information only, no action is required
- **Warning** – User can decide whether or not action is required
- **Minor** – Action is needed but the condition is not serious at this time
- **Major** – Action is needed now
- **Critical** – Action is needed now and the implications of the condition are serious
- **Fatal** – Non-Recoverable error or failure has occurred

Saving the NVRAM Event Log

This function saves a copy of the NVRAM event log as a text file on the Host PC’s hard drive.

To save the NVRAM event log:

1. In Tree View, click the Subsystem icon.
2. From the dropdown menu on the Events tab, choose *Subsystem Events in NVRAM*.
3. At the bottom of the window, click the **Save Event Log** button.
4. In the File Download dialog box, click the **Save** button.
5. In the Save dialog box, name the file, navigate to the folder where you want to save the log file, and click the **Save** button.

   A text file of the event log is saved to the Host PC's hard drive.

Clearing the NVRAM Event Log

This function clears the events from the NVRAM event log screen and from the NVRAM on the RAID controller. This function has no effect upon events reported in the WebPAM PRO Event Frame. "Viewing the Event Frame" on page 89.

To clear the NVRAM event log:

1. In Tree View, click the Subsystem icon.
2. From the dropdown menu on the Events tab, choose *System Events in NVRAM*.
3. At the bottom of the window, click the **Clear Event Log** button.
4. In the Confirmation dialog box, type **confirm** and click the **OK** button.

   All events are cleared from the screen and the RAID controller's non-volatile RAM.

Viewing Current Background Activities

To view the current background activities:

1. Click the Subsystem icon in Tree View.
2. Click the **Background Activities** tab in Management View.

   A list of current background activities appears, including:

   - Rebuild
   - Synchronization
   - Redundancy Check
   - Migration
   - Initialization
   - Media Patrol

Making Background Activity Settings

To make settings for background activities:

1. In Tree View, click the Subsystem icon.
2. From the dropdown menu on the Background Activities tab, choose *Settings*.
3. Click the dropdown menu to choose a priority of *Low*, *Medium*, or *High* for the following functions:
   - **Rebuild** – Rebuilds the data from a failed drive in a disk array
   - **Synchronization** – Checks the data integrity on disk arrays
   - **Initialization** – Sets all data bits in the logical drive to zero
   - **Redundancy Check** – Checks, reports and can correct data inconsistencies in logical drives
   - **Migration** – Change RAID level or add physical dries to disk arrays
   - **PDM** – Not currently supported on SuperTrak TX series
   - **Transition** – Not currently supported on SuperTrak TX series

   The rates are defined as follows:
   - **Low** – Fewer resources to activity, more to data read/write.
   - **Medium** – Balance of resources to activity and data read/write.
   - **High** – More resources to activity, fewer to data read/write.

   The following settings pertain to PDM, which is not currently supported on the SuperTrak TX series:
   - **Reassigned Block Threshold** – 1 to 512 blocks
   - **Error Block Threshold** – 1 to 1024 blocks
4. Check to enable or uncheck to disable the following functions:
   - **Media Patrol** – Checks the magnetic media on physical drives
   - **Auto Rebuild** – This function applies to conditions when an array goes Critical but no spare drive is present. When enabled, the disk array will begin to rebuild as soon as you replace the failed physical drive with an unconfigured physical drive of equal or greater size.

     For conditions when an array goes Critical and a spare drive of adequate size is present, a rebuild begins automatically. This is a separate function and always enabled.
5. Click the **Submit** button to save your settings.

Running Background Activities

To run a background activity from the Background Activities tab:

1. In Tree View, click the Subsystem icon.
2. From the dropdown menu on the **Background Activities** tab, choose one of the following activities:
   - **Media Patrol** – See “Running Media Patrol” on page 108
   - **Rebuild** – See “Rebuilding a Disk Array” on page 131
   - **Initialization** – See “Initializing a Logical Drive” on page 135
   - **Redundancy Check** – See “Running Redundancy Check” on page 136
3. In the next screen, make the choices as requested.
4. Click the **Start** button.

Running Media Patrol

Media Patrol checks the magnetic media on physical drives. See “Making Background Activity Settings” on page 107.

You can schedule Media Patrol to run automatically, see “Scheduling an Activity” on page 108.

To run Media Patrol:

1. In Tree View, click the Subsystem icon.
2. From the dropdown menu on the Background Activities tab, choose *Start Media Patrol*.
3. In the next screen, click the **Start** button.

Viewing Scheduled Activities

To view scheduled activities for this subsystem:

1. Click the Subsystem icon Tree View.
2. Click the **Scheduler** tab in Management View.

Scheduling an Activity

To set a scheduled activity for this subsystem:

1. Click the Subsystem icon Tree View.
2. From the dropdown menu on the Scheduler tab, choose *Add BGA Scheduler*.
3. Click the option button of the activity you want:
   - Media Patrol. See “Running Media Patrol” on page 108

- Redundancy Check. See “Running Redundancy Check” on page 136

4. In the Scheduler dialog box, check the *Enable This Schedule* box.
5. Click the option button for the Recurrence Pattern you want:
   - Daily
   - Weekly
   - Monthly
6. Click the **Next** button.
7. For a DAILY recurrence pattern, make the following setting:
   - Choose a Start Time for the activity, based on a 24-hour clock, from the dropdown menus.
   - Type the number of days between activities, from 1 to 255, into the Every days field.

   For a WEEKLY recurrence pattern, make the following settings:
   - Choose a Start Time for the activity, based on a 24-hour clock, from the dropdown menus.
   - Type the number of weeks between activities, from 1 to 52, into the Every weeks field.
   - Check the boxes for the days of the week you want the activity to run.

     You can choose from 1 to 7 days.

   For a MONTHLY recurrence pattern, make the following settings:
   - Choose a Start Time for the activity, based on a 24-hour clock, from the dropdown menus.
   - Choose the day of the month:
     - Choose a day of the month, 1 to 31, from the dropdown menu. See the Note below.
     - Choose a day of the month, first to last, and day of the week, from the dropdown menus.
   - Check the boxes for the months of the year you want the activity to run.

     You can choose from 1 to 12 months.
8. Choose a starting date in the Start From dropdown menus.

   The default is today's date.
9. Choose an End On option:
   - No end date (recommended).
   - End After the specified number of activities. Type the number of activities, from 1 to 255, into the field provided.
   - Until a specified date. Choose an end date from the dropdown menus.

     The default is today's date.

10. For Redundancy Check only:
    - Choose the Auto Fix option. This feature attempts to repair the problem when it finds an error.
    - Choose the Pause on Error option. This feature stops the process when it finds an error
    - Check the boxes beside the logical drives (all except RAID 0) to which this activity will apply.

      Note: Each logical drive can have only one scheduled Redundancy Check.
11. Click the **Submit** button.

Note

For monthly schedules, if you choose a higher number than a month has days, the activity will occur in the following month. For example, say you choose day 31. But there are only 30 days in the month of June. Therefore, the June activity will happen on July 1. The next activity will happen on July 31.

Deleting a Scheduled Activity

To delete a scheduled activity for this subsystem:

1. Click the Subsystem icon Tree View.
2. From the dropdown menu on the Scheduler tab, choose *Delete Schedules*.
3. Check the box to the left of the schedule you want to delete.
4. Click the **Submit** button.

Viewing System Configuration

To view the configuration of your complete system:

1. Click the Subsystem icon Tree View.
2. Click the **Configuration** tab in Management View.

   The following information is displayed:
   - **Host Information** – WebPAM PRO version, host name and IP address, OS version, and JVM version
   - **User List** – User name, status, and display name
   - **Controllers Summary** – Model and operational status
   - **Scheduled Activities List** – Type, recurrence, start time, and operational status
   - **Enclosures Summary** – ID, type, operational status, and description

- **Physical Drive List** – Device number, model, type, capacity, location, operational status, and configuration
- **Disk Array List** – ID, alias, operational status, configurable capacity, and free capacity
- **Logical Drive List** – Device number, alias, RAID level, capacity, ID, stripe size, sector size, and operational status
- **Spare Drive List** – ID, operational status, physical drive ID, capacity, revertibility, type (global or dedicated), and dedicated to array

Managing the Controller

The RAID controller is the heart of the RAID storage system. Management of Controllers includes the following functions:

- Viewing Controllers Information (page 112)
- Viewing Controller Information (page 112)
- Making Controller Settings (page 114)
- Silencing the Buzzer (page 114)
- Making Buzzer Settings (page 114)
- Testing the Buzzer (page 115)
- Viewing Buzzer Information (page 115)

Viewing Controllers Information

Controllers information refers to a brief summary about the controller. To view Controller information:

1. Click the Subsystem icon in Tree View.
2. Click the Controllers icon.

   The controllers information appears under the Information tab in Management View. Controllers information includes:

   - Controller ID
   - Model of the RAID controller
   - Status of the RAID controller – OK means normal

Viewing Controller Information

Controller information refers to detailed information about the controller. To view Controller information:

1. Click the Subsystem icon in Tree View.
2. Click the Controllers icon.
3. Click the Controller icon.

   The controller information appears on the Information tab in Management View.

   Controller information includes:

   - Controller ID (1 or 2)
   - Alias
   - Vendor
   - Model

- Operational Status
- Power On Time
- Cache Usage
- Dirty Cache Usage
- Part Number
- Serial Number
- Hardware Revision number
- WWN – World Wide Number of the controller
- Manufacturing Date
- SCSI Protocols Supported
- Host Driver Version
- BIOS Version
- Single Image Version
- Single Image Build Date

  The Host driver is installed and updated through your operating system. You can update the other items automatically. See “Updating SuperTrak BIOS and Firmware” on page 211.

Advanced controller information includes:

- Memory Type
- Memory Size
- Flash Type – Stores firmware, software, and user configurations.
- Flash Size
- NVRAM Type
- NVRAM Size
- Preferred Cache Line Size
- Cache Line Size
- Coercion
- Coercion Method
- SMART* – Self-Monitoring, Analysis and Reporting System for physical drives
- Write Back Cache Flush Interval
- Write Through Mode
- Enclosure Polling interval*

Items marked with an asterisk (*) are user adjustable. See “Making Controller Settings” on page 114.

Making Controller Settings

To make Controller settings:

1. Click the Subsystem icon in Tree View.
2. Click the Controllers icon.
3. Click the Controller icon.
4. Click the **Settings** tab in Management View.
5. Make the following settings as needed:
   - Check the SMART Log box to enable the Self-Monitoring, Analysis, and Reporting System (SMART).
   - Enter a polling interval (1 to 1092 minutes) in SMART Polling Interval field.
   - Enter a time interval (15 to 255 seconds) in the Enclosure Polling Interval field.

     Note: Adaptive Writeback Cache and Forced Read Ahead Cache are planned features for SuperTrak.
6. Click the **Submit** button.

   The changes take effect immediately.

Silencing the Buzzer

To silence the buzzer for the current event:

1. Click the Subsystem icon in Tree View.
2. Click the Controllers icon.
3. Click the Controller icon.
4. Click the **Buzzer** tab in Management View.
5. Click the **Mute** button.

   The buzzer goes silent but will sound again for future events.

Making Buzzer Settings

To make buzzer settings:

1. Click the Subsystem icon in Tree View.
2. Click the Controllers icon.
3. Click the Controller icon.
4. From the dropdown menu on the Buzzer tab, choose *Settings*.
5. Check the Enable Buzzer box to enable the buzzer.

Uncheck the box to disable the buzzer.

6. Click the **Submit** button

   The changes take effect immediately.

Testing the Buzzer

You must enable the buzzer before you can test it. See “Making Buzzer Settings,” above.

To test the buzzer:

1. Click the Subsystem icon in Tree View.
2. Click the Controllers icon.
3. Click the Controller icon.
4. Click the **Buzzer** tab in Management View.
5. Click the **Sound** button.

   The buzzer sounds a continuous tone.

6. Click the **Mute** button.

   The buzzer goes silent but remains enabled.

Viewing Buzzer Information

This function refers to the buzzer on the SuperTrak RAID controller card.

To view buzzer information:

1. Click the Subsystem icon in Tree View.
2. Click the Controllers icon.
3. Click the Controller icon.
4. Click the **Buzzer** tab in Management View.

Managing Enclosures

This function of WebPAM PRO does not apply to the SuperTrak RAID controller card installed in the Host PC, except for one item:

- Viewing Enclosure Information (page 116)

Viewing Enclosure Information

Enclosure information includes:

- Enclosure ID
- Enclosure Type – Virtual
- SEP Firmware Version
- Maximum number of Controllers, Physical Drive Slots, Fans, Blowers, Temperature Sensors, Power Supply Units, Batteries, and Voltage Sensors.

This information might be useful when contacting Technical Support.

To view Enclosure information:

1. Click the Subsystem icon in Tree View.
2. Click the Enclosures icon.
3. Click the Enclosure icon.

   The Enclosure information appears on the Information tab.

See the following topics:

- “Viewing Controller Information” on page 112
- “Contacting Technical Support” on page 199.

Note

In addition to the SuperTrak TX Series, WebPAM PRO also supports the SuperTrak EX Series and VTrak RAID Subsystems.

For more information about managing those products with WebPAM PRO, see the online help or refer to the Controller’s *User Manual* or the Subsystem’s *Product Manual.*

Managing Physical Drives

Managing Physical Drives deals with the physical disk drives under the SuperTrak RAID controller, including the following functions:

- Viewing a List of Physical Drives (page 117)
- Locating a Physical Drive (page 117)
- Viewing Physical Drive Information (page 118)
- Making Physical Drive Settings (page 118)

Viewing a List of Physical Drives

To view a list of physical drives in this enclosure:

1. Click the Subsystem icon in Tree View.
2. Click the Enclosures icon.
3. Click the Enclosure icon.
4. Click the Physical Drives icon.

   The list of physical drives appears in Management View.

   Click the **PD** link to view a specific physical drive. See “Viewing Physical Drive Information” on page 118.

   Note that Enclosure and Slot numbers are assigned by the controller and do not necessarily correspond to the actual physical locations of the disk drives, especially when the disk drives are installed in an enclosure not designed by Promise.

Locating a Physical Drive

Virtual or Third Party Enclosures

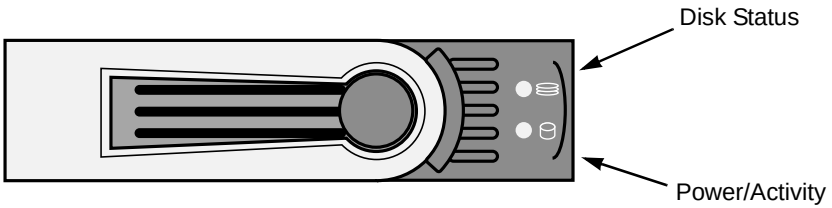
Support for this feature depends on how your system or enclosure was set up. Direct-connect systems with individual LED connections and SGPIO enclosures support individual physical drive LEDs. Other systems or enclosures might or might not support them. See “Appendix C: LED Backplane Connections” on page 215.

To locate a physical drive in the enclosure, click the **Locate PDx** button. The LED for the carrier holding the physical drive will blink for one minute.

Promise Enclosures

To locate a physical drive in the VTrak JBOD enclosure, click the Locate PDx button. The disk status LED will blink for one minute to identify the carrier holding the physical drive.

Figure 6. VTrak drive carrier LEDs



Viewing Physical Drive Information

To view physical drive information:

1. Click the Subsystem icon in Tree View.
2. Click the Enclosures icon.
3. Click the Enclosure icon.
4. Click the Physical Drives icon.
5. Click a Physical Drive icon.

Useful information provided here includes:

- **Operational Status** – OK is normal.
- **Configuration Status** – The array to which the drive is assigned or its spare designation, including Unconfigured, Stale, Global Spare, Dedicated Spare.

Making Physical Drive Settings

The physical drive setting is the drive's configuration.

Warning

When you change a physical drive's configuration, you will lose all data on the drive.

If the physical drive belonged to a disk array, you will lose the disk array, logical drives, and all data they contained.

Be sure to backup any important data before you change drive configuration!

To make physical drive settings:

1. Click the Subsystem icon in Tree View.
2. Click the Enclosures icon.
3. Click the Enclosure icon.
4. Click the Physical Drives icon.

5. Click a Physical Drive icon.
6. Click the **Settings** tab in Management View.
7. Choose an option from the Convert Configuration Status dropdown menu.
   - **Unconfigured** – Default. Drive can be used in a disk array.
   - **PassThru** – Configure drive to be visible to Host PC's OS as a single drive. Cannot be used in disk array.
8. Click the **Submit** button.

Managing Disk Arrays

Disk Array Management includes the following functions:

- Viewing Disk Arrays (page 120)
- Locating a Disk Array (page 120)
- Creating a Disk Array (page 121)
- Deleting a Disk Array (page 127)
- Viewing Disk Array Information (page 127)
- Creating a Logical Drive (page 128)
- Deleting a Logical Drive (page 129)
- Migrating a Disk Array (page 130)
- Rebuilding a Disk Array (page 131)
- Preparing a Disk Array for Transport (page 132)

Viewing Disk Arrays

To view the disk arrays in this enclosure plus any expanded or cascaded enclosures:

1. Click the Subsystem icon in Tree View.
2. Click the Disk Arrays icon.

   A list of disk arrays appears in Management View.

   Click the **DA** link to view a specific disk array. See “Viewing Disk Array Information” on page 127.

Locating a Disk Array

Virtual or Third Party Enclosures

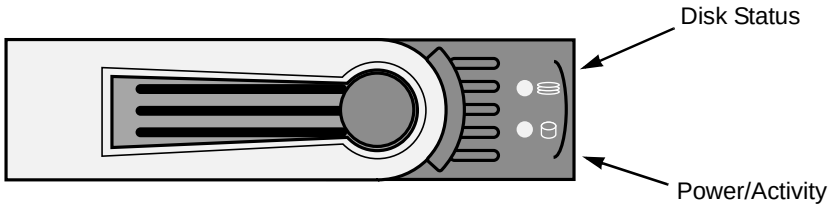
Support for this feature depends on how your system or enclosure was set up. Direct-connect systems with individual LED connections and SGPIO enclosures support individual physical drive LEDs. Other systems or enclosures might or might not support them. See “Appendix C: LED Backplane Connections” on page 215.

To locate a disk array in the enclosure, click the **Locate DAx** button. The LEDs for the carriers holding the physical drives used by the disk array will blink for one minute.

Promise Enclosures

To locate a disk array in a VTrak JBOD enclosure, click the **Locate DAx** button. The disk status LEDs will blink for one minute to identify the carriers holding the physical drives used by the disk array.

Figure 7. VTrak drive carrier LEDs



Creating a Disk Array

WebPAM PRO provides three methods of creating a disk array:

- **Automatic** – Creates a default disk array and logical drive based on unconfigured physical drives in the system. No user choices. See “Creating a Disk Array – Automatic Configuration” on page 122.
- **Express** – You choose the RAID characteristics and type of application. Creates a disk array and logical drive(s) based on your input. See “Creating a Disk Array – Express Configuration” on page 123.
- **Advanced** – You specify all parameters for a new disk array. One logical drive will be made automatically when you create the disk array. If you specify less than the total available capacity, you can use the remaining space to create additional logical drives now or at a later time. See “Creating a Disk Array – Advanced Configuration” on page 125.

Creating a Disk Array – Automatic Configuration

The Disk Array – Automatic Configuration option enables you to create a new disk array following a default set of parameters. One logical drive will be made automatically when you create the disk array. To create a Disk Array using the Automatic function:

1. Click the Subsystem icon in Tree View.
2. Click the Disk Arrays icon.
3. From dropdown menu on the Create tab, choose *Automatic*.

   The following parameters display:

   - **Disk Arrays** – The number of physical drives in the disk array, their slot numbers, configurable capacity, and the number of logical drives to be created
   - **Logical Drives** – The ID number of the logical drive(s), their RAID level, capacity, and stripe size
   - **Spare Drives** – The physical drive slot number of the dedicated hot spare assigned to this disk array. A hot spare drive is created for all RAID levels except RAID 0, when five or more unconfigured physical drives are available
4. If you accept these parameters, click the **Submit** button.

   The new disk array appears in the Disk Array List the Information tab.

   If you do NOT accept these parameters, use the Advanced option to create your disk array.

Creating a Disk Array – Express Configuration

The Disk Array – Express Configuration option enables you to choose the parameters for a new disk array by specifying the characteristics you want. With this method, you can create multiple logical drives at the same time you create your disk array. However, all of the logical drives will be the same.

If you prefer to specific the parameters directly, use the Advanced option to create your disk array.

If you are uncertain about choosing parameters for your disk array, use the Automatic option.

To create a new disk array:

1. Click the Subsystem icon in Tree View.
2. Click the Disk Arrays icon.
3. From the dropdown menu on the Create tab, choose *Express*.
4. Check the boxes to choose any one or combination of:
   - **Redundancy** – The array will remain available if a physical drive fails
   - **Capacity** – The greatest possible amount of data capacity
   - **Performance** – The highest possible read/write speed
   - **Mixing SATA/SAS Drive** – Check this box if you want to use both SATA and SAS drives in the same disk array.

     If the box is unchecked, and you have both SATA and SAS drives, different arrays will be created for each type of drive.
5. In the Number of Logical Drives field, enter the number of logical drives you want to make from this disk array.
6. From the Application Type menu, choose an application that best describes your intended use for this disk array:
   - File Server
   - Video Stream
   - Transaction Data
   - Transaction Log
   - Other
7. Click the **Update** button.

   Or check the Automatic Update box and updates will occur automatically.

   The following parameters display:
   - **Disk Arrays** – The number of physical drives in the disk array, their slot numbers, configurable capacity, and the number of logical drives to be created

- **Logical Drives** – The slot number of the logical drive(s), their RAID level, capacity, and stripe size
- **Spare Drives** – The physical drive slot number of the dedicated hot spare assigned to this disk array (all RAID levels except RAID 0)

If you accept these parameters, proceed to the next step.

If you do NOT accept these parameters, review and modify your choices in the previous steps.

8. When you are done, click the **Submit** button.

The new disk array appears in the Disk Array List the Information tab.

Creating a Disk Array – Advanced Configuration

The Disk Array – Advanced Configuration option enables you to directly specify all parameters for a new disk array. One logical drive will be made automatically when you create the disk array. If you specify less than the total available capacity, you can use the remaining space to create additional logical drives now or at a later time.

If you are uncertain about choosing parameters for your disk array, use the Express or Automatic option to create your disk array.

To create a new disk array:

1. Click the Subsystem icon in Tree View.
2. Click the Disk Arrays icon.
3. From the dropdown menu on the Create tab, choose *Advanced*.

Step 1 – Disk Array Creation

1. Check the box if you want to enable Media Patrol.

   For more information, see “Media Patrol” on page 179.
2. Highlight physical drives you want in the disk array from the Available list and press the **>>** button to move them to the Selected list.

   You can also double-click them to move them.
3. When you are done, click the **Next** button.

Step 2 – Logical Drive Creation

Logical Drive Creation enables you to specify logical drives under the new disk array. Enter the information for a logical drive, then click the **Update** button. If there is free capacity remaining, you can specify another logical drive now or wait until later. You can create up to 8 logical drives per array.

1. Optional. Type an alias into the field provided.
2. Choose a RAID level for the logical drive from the dropdown menu.

   The choice of RAID levels depends the number of physical drives you selected.
3. Specify a Capacity and the unit of measure (MB, GB, TB).

   This value will be the data capacity of the first logical drive in your new disk array. If you specify less than disk array's maximum capacity, the remainder will be available for additional logical drives which you can create later.
4. Specify a Stripe size from the dropdown menu.

   64 KB and 128 KB are available. 64 KB is the default.

5. Specify a Sector size from the dropdown menu.

   512 B, 1 KB, 2 KB, and 4 KB are available. 512 B is the default.

6. From the Initialization dropdown menu, choose an Initialization policy.

   None and Quick are available. None is the default but is not recommended. See “Initialization” on page 175.

7. Click the **Update** button.

   A new logical drive is displayed under New Logical Drives.

   Repeat the above steps to specify additional logical drives as desired.

8. When you are done specifying logical drives, click the **Next** button.

Step 3 – Summary

The Summary lists the disk array and logical drive information you specified.

To proceed with disk array and logical drive creation, click the **Submit** button.

The new disk array appears in the Disk Array List the Information tab.

Note

This function does not automatically create a hot spare drive. After the disk array is created, you can create a hot spare drive for it. For more information, see “Creating a Spare Drive” on page 137.

Deleting a Disk Array

The Disk Arrays–Delete tab enables you to delete existing disk arrays.

Warning

When you delete a disk array, you delete the logical drives and all of the data on them. Backup any important data before you delete!

To delete a disk array:

1. Click the Subsystem icon in Tree View.
2. Click the Disk Arrays icon.
3. Click the **Delete** tab in Management View.
4. Check the box to the left of the disk array you want to delete.
5. Click the **Submit** button.
6. In the confirmation box, type the word **confirm** in the field provided.
7. Click the **OK** button.

The chosen disk array disappears from the Disk Array List the Information tab.

Viewing Disk Array Information

To view Disk Array information:

1. Click the Subsystem icon in Tree View.
2. Click the Disk Arrays icon.
3. Click the Disk Array icon.

   The disk array information is shown in Management View.

Disk Array Operational Status

- **OK** – This is the normal state of a logical drive. When a logical drive is Functional, it is ready for immediate use. RAID Levels 1 and 10 have full redundancy.
- **Synchronizing** – This condition is temporary. Synchronizing is a maintenance function that verifies the integrity of data and redundancy in the logical drive. When a logical drive is Synchronizing, it will function and your data is available. However, access will be slower due to the synchronizing operation.
- **Critical / Degraded** – This condition arises as the result of a physical drive failure. A degraded logical drive will still function and your data is still

available. However, the logical drive has lost redundancy (fault tolerance). You must determine the cause of the problem and correct it.

- **Rebuilding** – This condition is temporary. When a physical drive has been replaced, the logical drive automatically begins rebuilding in order to restore redundancy (fault tolerance). When a logical drive is rebuilding, it will function and your data is available. However, access will be slower due to the rebuilding operation.
- **Transport Ready** – After you perform a successful Prepare for Transport operation, this condition means you can remove the physical drives of this disk array and move them to another enclosure or different drive slots. After you relocate the physical drives, the disk array status will show OK.

Creating a Logical Drive

When you create a disk array, you automatically create one logical drive also. If the initial logical drive used less than the full capacity of the disk array, you can create additional logical drives from the same disk array. You can create up to 8 logical drives per array.

To create a logical drive:

1. Click the Subsystem icon in Tree View.
2. Click the Disk Arrays icon.
3. Click the Disk Array icon.
4. Click the **Create LD** tab in Management View.
5. Optional. Enter an alias (name) in the Alias field.

   Maximum of 16 characters. Use letters, numbers, one space between words, and underscore. An alias is optional.
6. From the RAID Level dropdown list, choose a RAID level for this logical drive.

   All RAID levels supported by the disk array appear in the list. See “Choosing a RAID Level” on page 172.
7. Enter a capacity and choose unit of measure (MB, GB, TB).

   The default value is the available capacity of the disk array. You can use this value or any lesser amount.
8. From the Stripe dropdown menu, choose a Stripe size for this logical drive.

   The choices are 64 KB and 128 KB. 64 KB is the default. See “Choosing Stripe Block Size” on page 174.
9. From the Sector dropdown menu, choose a Sector size for this logical drive.

The choices are 512 B, 1 KB, 2 KB, and 4 KB. 512 B is the default. See “Choosing Sector Size” on page 174.

10. From the Initialization dropdown menu, choose an Initialization policy.

    The choices are None and Quick. See “Initialization” on page 175.

11. Click the **Update** button to enter the logical drive parameters.
12. Review the results. If there is remaining space the disk array, you can create another logical drive, following the steps above. Each logical drive can have a different set of parameters.
13. Click the **Next** button when you are done.

    A new window displays with the disk array information and the proposed logical drives with their parameters.

14. Click the **Submit** button create the logical drives.

The new logical drive appears in the Logical Drive List the Information tab.

If you created a fault-tolerant logical drive (any RAID level except RAID 0), the Operational Status of new logical drive will display *Synchronizing* for several minutes after creation. You can use the logical drive during this period but read/write performance could be slower than normal.

Deleting a Logical Drive

Warning

When you delete a logical drive, you delete all data on the logical drive. Backup any important data before you delete!

To delete a logical drive:

1. Click the Subsystem icon in Tree View.
2. Click the Disk Arrays icon.
3. Click the Disk Array icon.
4. Click the **Delete LD** tab in Management View.
5. Check the box to the left of the logical drive you want to delete.
6. Click the **Submit** button.

   In the confirmation box, type the word **confirm** in the field provided.

7. Click the **OK** button.

The chosen logical disappears from the Logical Drive List the Information tab.

Migrating a Disk Array

On SuperTrak, RAID level migration is performed on the disk array but it applies to the logical drives. The action of migrating a disk array means either or both:

- Change its RAID Level
- Increase the number of disk drives (sometimes called *expansion*)

For a list of Migration options and other important information, see “RAID Level Migration” on page 176.

To Migrate an existing disk array:

1. Click the Subsystem icon in Tree View.
2. Click the Disk Arrays icon.
3. Click the Disk Array icon.
4. From the dropdown menu on the Background Activities tab, choose *Start Migration*.
5. Highlight physical drives you want in the disk array from the Available list and press the >> button to move them to the Selected list. You can also double-click them to move them.
6. When you are done, click the **Next** button
7. Choose a new RAID Level, if desired
8. To expand the capacity of one or more logical drives, check the Expand Capacity box
9. If you checked the Expand Capacity box, enter a number into the Capacity field and choose the appropriate unit of measure (MB, GB, TB)
10. Under Capacity Usage, highlight the logical drive whose RAID level you want to change or whose capacity you want to expand
11. Click the **Update** button.

    The logical drive changes to reflect your choices.
12. Update other logical drives using the same method.
13. When you are done making changes, click the **Next** button.
14. Click the **Submit** button to begin Migration.

    In the confirmation box, type the word **confirm** in the field provided.
15. Click the **OK** button.

To set Migration priority, see “Making Background Activity Settings” on page 107.

Rebuilding a Disk Array

When you rebuild a disk array, you are actually rebuilding the data on a replacement physical drive.

Rebuilding Automatically

Normally, a disk array would rebuild itself using a hot disk drive, after going Critical. However, if the Auto Rebuild function is disabled or no spare drives are available, you must initiate the procedure.

To enable Auto Rebuild, see “Making Background Activity Settings” on page 107.

To create a spare drive, see “Creating a Spare Drive” on page 137.

For more information, see “Hot Spare Drives” on page 176.

Rebuilding Manually

If a physical drive has failed, identify and replace the drive, then rebuild the disk array as described below:

1. Click the Subsystem icon in Tree View.
2. Click the Disk Arrays icon.
3. Click the Disk Array icon.

   If there are multiple disk arrays, choose the icon with the yellow !.
4. From the dropdown menu on the Background Activity tab, choose *Start Rebuild*.
5. Choose Source physical drive.

   This is a remaining functional physical drive in the disk array.
6. Choose the Target physical drive.

   This is the replacement physical drive.
7. Click the **Submit** button.

The Disk Array Background Activity tab will show the rebuild the replacement (target) physical drive. Depending the size of the physical disk involved, this process will take some time.

To view more information, click the **Rebuild on PDx** link.

To set Rebuild priority, see “Making Background Activity Settings” on page 107.

Running Media Patrol on a Disk Array

Media Patrol checks the magnetic media on physical drives.

You can schedule Media Patrol to run automatically, see “Scheduling an Activity” on page 108.

To start Media Patrol:

1. Click the Subsystem icon in Tree View.
2. Click the Disk Arrays icon.
3. Click the Disk Array icon.
4. From the dropdown menu on the Background Activities tab, choose *Start Media Patrol*.
5. Click the **Start** button.

Preparing a Disk Array for Transport

Important

Before you can use this feature:

- There must be a dedicated spare disk drive assigned to this disk array.
- The disk array’s Operational Status must be OK.

To prepare a disk array for transport:

1. Click the Subsystem icon in Tree View.
2. Click the Disk Arrays icon.
3. Click the Disk Array icon.
4. Click the **Transport** tab in Management View.
5. Click the **Submit** button.
6. In the confirmation box, type the word **confirm** in the field provided.
7. Click the **OK** button.
8. After the Transition is complete, move the physical drives comprising the disk array to their new locations.
9. Click the **Refresh** button in your Browser.

   The drives appear in their new locations and disk array status displays OK.

Managing Logical Drives

Logical drives are made from disk arrays. In the Tree, you can see a graphic representation of the logical drives that belong to each array. You can see a summary of all logical drives in the subsystem under Logical Drive Summary.

Logical drive management includes the following functions:

- Viewing Information for All Logical Drives (page 133)
- Locating a Logical Drive (page 134)
- Viewing Logical Drive Information (page 134)
- Changing Logical Drive Settings (page 135)
- Initializing a Logical Drive (page 135)
- Running Redundancy Check (page 136)

Viewing Information for All Logical Drives

To view information about all logical drives in a disk array:

1. Click the Subsystem icon in Tree View.
2. Click the Disk Arrays icon.
3. Click the Disk Array icon.
4. Click the Logical Drives icon

Logical Drive Status

- **OK** – This is the normal state of a logical drive. When a logical drive is OK, it is ready for immediate use. For RAID Levels other than RAID 0 (Striping), the logical drive has fault tolerance.
- **Critical** – This condition arises as the result of a physical drive failure. Or, one of the physical drives was accidently or intentionally disconnected or pulled from its enclosure. A critical or degraded logical drive will still function and your data is still available. However, the logical drive has lost its fault tolerance.
- **Offline** – This condition arises as the result of multiple physical drive failures. Or, multiple physical drives were accidently or intentionally disconnected or pulled from its enclosure. An offline logical drive does not function and your data is not available.

To create a logical drive, see “Creating a Logical Drive” on page 128.

To delete a logical drive, see “Deleting a Logical Drive” on page 129.

For a Critical or Offline logical drive, see “Critical & Offline Logical Drives” on page 180.

Locating a Logical Drive

Virtual or Third Party Enclosures

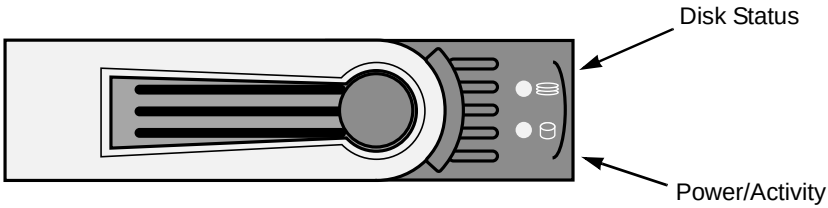
Support for this feature depends on how your system or enclosure was set up. Direct-connect systems with individual LED connections and SGPIO enclosures support individual physical drive LEDs. Other systems or enclosures might or might not support them. See “Appendix C: LED Backplane Connections” on page 215.

To locate a logical drive in the enclosure, click the **Locate LDx** button. The LEDs for the carriers holding the physical drives used by the logical drive will blink for one minute.

Promise Enclosures

To locate a logical drive in the VTrak JBOD enclosure, click the **Locate LDx** button. The disk status LEDs will blink for one minute to identify the carriers holding the physical drives used by the logical drive.

Figure 8. VTrak drive carrier LEDs



Viewing Logical Drive Information

To view information for a single logical drive:

1. Click the Subsystem icon in Tree View.
2. Click the Disk Arrays icon.
3. Click the Disk Array icon.
4. Click the Logical Drives icon
5. Click the Logical Drive icon.

To specify an Alias or set the Read and Write Policies, click the Settings tab.

Logical Drive Status

See “Logical Drive Status” on page 133.

Logical Drive Synchronization

Synchronization is an automatic procedure applied to logical drives when they are created. *Yes* means the logical drive was synchronized.

Adjustable Items

- Alias – Optional
- Read Policy
- Write Policy

See “Changing Logical Drive Settings” on page 135.

Changing Logical Drive Settings

The only individual logical drive setting is an alias. An alias is optional. To make logical drive settings:

1. Click the Subsystem icon in Tree View.
2. Click the Disk Arrays icon.
3. Click the Disk Array icon.
4. Click the Logical Drives icon
5. Click the Logical Drive icon.
6. Click the **Settings** tab in Management View.
7. Optional. Enter an alias in the Logical Drive Alias field.

   Maximum of 16 characters. Use letters, numbers, one space between words, and underscore. An alias is optional.
8. Click the **Submit** button.

Initializing a Logical Drive

Initialization sets the data bits in the logical drive to zero. The action removes any residual data left behind from earlier configurations. Initialization is recommended for new logical drives. You can also initialize an existing logical drive. See “Initialization” on page 175 for more information.

Warning

When you initialize a logical drive, all the data the logical drive will be lost. Backup any important data before you initialize!

To initialize a logical drive:

1. Click the Subsystem icon in Tree View.

2. Click the Logical Drive Summary icon.
3. Click the icon of the logical drive you want to Initialize.
4. From the dropdown menu on the Background Activities tab, choose *Initialization*.
5. Enter a value in the Quick Initialization Size field. This value is the size of the initialization blocks in MB.
6. Click the **Submit** button.
7. In the confirmation box, type the word **confirm** in the field provided.
8. Click the **OK** button.

To set Initialization priority, see “Making Background Activity Settings” on page 107. Also see “Running Background Activities” on page 108.

Running Redundancy Check

Redundancy Check is a routine maintenance procedure for fault-tolerant disk arrays (those with redundancy) that ensures all the data matches exactly. Redundancy Check can also correct inconsistencies. You can also schedule a Redundancy Check. See “Scheduling an Activity” on page 108.

Redundancy Check a Logical Drive:

1. Click the Subsystem icon in Tree View.
2. Click the Logical Drive Summary icon.
3. Click the icon of the logical drive you want to Redundancy Check.
4. From dropdown menu on the Background Activities tab, choose *Redundancy Check*.
   - To choose *Auto Fix*, check the box.

     This feature attempts to repair the problem when it finds an error.
   - To choose *Pause On Error*, check the box.

     This feature stops the process when it finds an error.

     If Auto Fix is also checked, the process stops only when it finds a non-repairable error.
5. Click the **Submit** button.

To view the progress of the Redundancy Check, click the **Background Activity** tab.

To set Redundancy Check priority, see “Making Background Activity Settings” on page 107. Also see “Running Background Activities” on page 108.

Managing Spare Drives

When a physical drive in a disk array fails and a spare drive of adequate capacity is available, the disk array will begin to rebuild automatically using the spare drive. See “Critical & Offline Logical Drives” on page 180.

Spare drive management includes the following functions:

- Viewing a List of Spare Drives (page 137)
- Creating a Spare Drive (page 137)
- Deleting Spare Drive (page 138)
- Making Spare Drive Settings (page 139)

Viewing a List of Spare Drives

To view a list of spare drives:

1. Click the Subsystem icon in Tree View.
2. Click the Spare Drives icon.

The information includes:

- **ID** – The unique ID number assigned to the spare drive.
- **Operational Status** – OK is normal. Can also show Rebuilding or Offline.
- **Physical Drive ID** – The ID number of the physical drive assigned as a spare
- **Capacity** – The data storage capacity of this spare drive.
- **Type** – Global, can be used by any disk array. Dedicated, can only be used by the assigned disk arrays.
- **Dedicated to Disk Arrays** – For dedicated spares, the disk arrays to which they are assigned. Global spares show N/A.

Creating a Spare Drive

Important

- There must be an unconfigured physical drive available to assign as a spare drive. See “Viewing a List of Physical Drives” on page 117.
- Be sure the spare drive you choose has capacity equal to or greater than the smallest physical drive assigned to the disk array.

To create a spare drive:

1. Click the Subsystem icon in Tree View.

2. Click the Spare Drives icon.
3. Click the **Create** tab in Management View.
4. Choose a spare type, *Global* or *Dedicated*.
5. In the Physical drives field, highlight the physical drive you want to assign as a spare drive in the Available list and press the **>>** button to move the drive to the Selected list.

   You can also double-click drives to move them.
6. If you chose a *Dedicated* spare drive, in the Dedicated to Disk Arrays field, highlight disk array to which you want assign the spare drive from the Available list and press the **>>** button to move the array to the Selected list.

   You can also double-click arrays to move them.
7. Click the **Update** button.

   Your choices are displayed under New Hot Spare Drives.
8. If you agree with the proposed choices, click the **Submit** button.

Deleting Spare Drive

Note

If an existing spare drive has the wrong parameters for your needs, click the Settings tab to change the parameters rather than delete the spare drive and create a new one.

To delete a spare drive:

1. Click the Subsystem icon in Tree View.
2. Click the Spare Drives icon.
3. Click the **Delete** tab in Management View.
4. Check the box to the left of the spare drive you want to delete.
5. Click the **Submit** button.

   In the confirmation box, type the word **confirm** in the field provided.
6. Click the **OK** button.

Making Spare Drive Settings

The Spare Drive–Settings tab enables you to change the settings of an existing spare drive. To change spare drive settings:

1. Click the Subsystem icon in Tree View.
2. Click the Spare Drives icon.
3. Click the Spare Drive icon.
4. Click the **Settings** tab in Management View.
5. Choose a spare type, *Global* or *Dedicated*.
6. If you chose a *Dedicated* spare drive, in the Dedicated to Disk Arrays field, highlight the disk array to which you want assign the spare drive from the Available list and press the **>>** button to move them to the Selected list.

   You can also double-click array to move it.
7. Click the **Submit** button.

Working with the Logical Drive Summary

The Logical Drive Summary displays a list of all logical drives under the SuperTrak controller including logical drives in expanded or cascaded enclosures. This list does not arrange the logical drives under the disk array to which they belong nor under the enclosure in which they are located.

Logical Drive Summary includes the following functions:

- Viewing a List of All Logical Drives (page 140)
- Locating a Logical Drive (page 140)
- Viewing Individual Logical Drive Information (page 141)

Viewing a List of All Logical Drives

To view a list of all logical drives in all enclosures:

1. Click the Subsystem icon in Tree View.
2. Click the Logical Drive Summary icon.

Locating a Logical Drive

Virtual or Third Party Enclosures

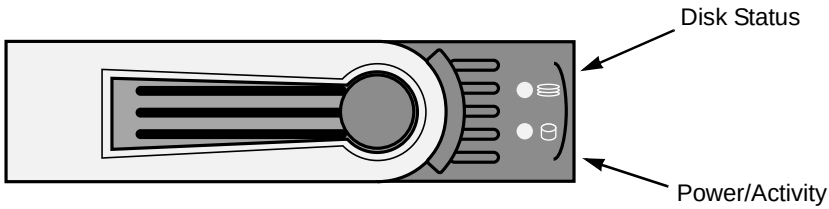
Support for this feature depends on how your system or enclosure was set up. Direct-connect systems with individual LED connections and SGPIO enclosures support individual physical drive LEDs. Other systems or enclosures might or might not support them. See “Appendix C: LED Backplane Connections” on page 215.

To locate a logical drive in the enclosure, click the **Locate LDx** button. The LEDs for the carriers holding the physical drives used by the logical drive will blink for one minute.

Promise Enclosures

To locate a logical drive in the VTrak JBOD enclosure, click the **Locate LDx** button. The disk status LEDs will blink for one minute to identify the carriers holding the physical drives used by the logical drive.

Figure 9. VTrak drive carrier LEDs



Viewing Individual Logical Drive Information

1. Click the Subsystem icon in Tree View.
2. Click the Logical Drive Summary icon.
3. Click the Logical Drive icon.

   The information and location for the logical drive appear in Management View. See Viewing Logical Drive Information (page 134).

Chapter 6: Management with the CLI

- Opening the CLI on Windows (below)
- Opening the CLI on Linux (page 144)
- Table of Supported Commands (page 145)
- Notes and Conventions (page 146)
- List of Supported Commands (page 147)

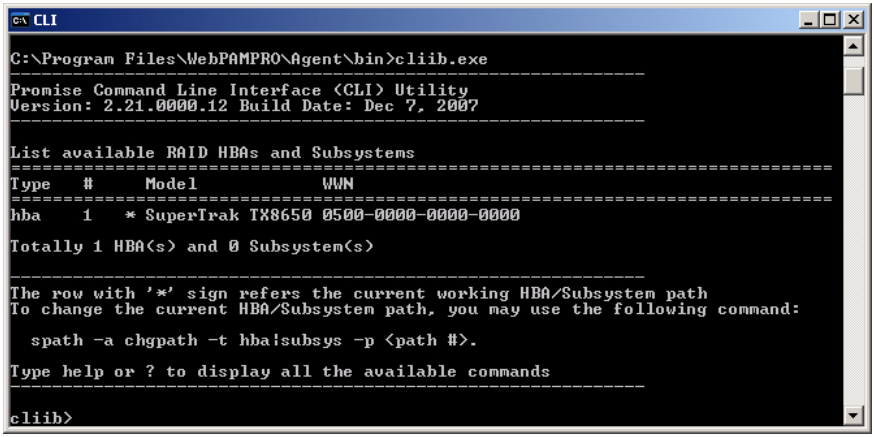
SuperTrak TX Controller's Command Line Interface (CLI) provides rapid setup of disk arrays and logical drives. You can also manage your SuperTrak system using the CLI. However, ongoing management is much easier with the SuperBuild utility or WebPAM PRO.

Opening the CLI on Windows

To open the CLI, click the **CLI icon** on the desktop (right), or:

1. Go to **Start > Run** and click the **Browse** button.
2. Navigate to the **C:\Program Files\WebPAMPRO\Agent\bin** folder.
3. Click **cliib.exe** file then click the **Open** button.
4. Click the **OK** button in the Run dialog box.

   The CLI window opens.


CLI
C:\Program Files\WebPAMPRO\Agent\bin>cliib.exe
Promise Command Line Interface (CLI) Utility
Version: 2.21.0000.12 Build Date: Dec 7, 2007
List available RAID HBAs and Subsystems
Type # Model WWN
hba 1 * SuperTrak TX8650 0500-0000-0000-0000
Totally 1 HBA(s) and 0 Subsystem(s)
The row with '*' sign refers the current working HBA/Subsystem path
To change the current HBA/Subsystem path, you may use the following command:
spath -a chgpath -t hba|subsys -p <path #>.
Type help or ? to display all the available commands
cliib>

Opening the CLI on Linux

To open the CLI:

1. Open a terminal window.
2. Go to the **/opt/Promise/WebPAMPRO/Agent/bin** directory.
3. Type **./cliib** and press Enter.

   The CLI runs in the terminal window.

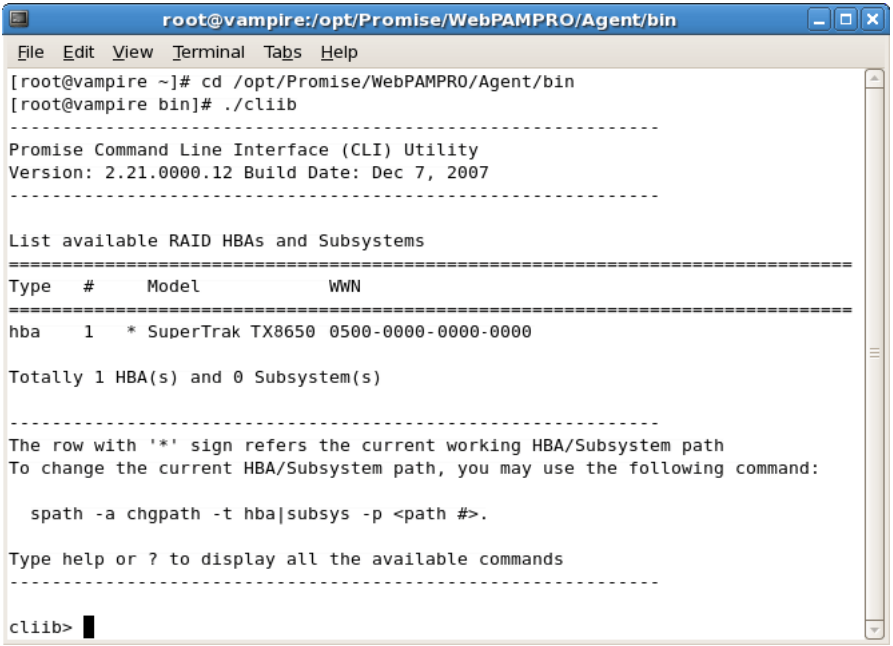

root@vampire:/opt/Promise/WebPAMPRO/Agent/bin
File Edit View Terminal Tabs Help
[root@vampire ~]# cd /opt/Promise/WebPAMPRO/Agent/bin
[root@vampire bin]# ./cliib
Promise Command Line Interface (CLI) Utility
Version: 2.21.0000.12 Build Date: Dec 7, 2007
List available RAID HBAs and Subsystems
Type # Model WWN
hba 1 * SuperTrak TX8650 0500-0000-0000-0000
Totally 1 HBA(s) and 0 Subsystem(s)
The row with '*' sign refers the current working HBA/Subsystem path
To change the current HBA/Subsystem path, you may use the following command:
spath -a chgpath -t hba|subsys -p <path #>.
Type help or ? to display all the available commands
cliib>

Table of Supported Commands

Command	Action
about	View utility information.
array	View or edit array information. Create, edit, or delete a new or existing array. Create, edit, or delete logical drives in an existing array. To physically locate an array in an enclosure. Accept an incomplete array condition.
bga	View status of all current background activities. Enable or disable relevant background activities. Modify the background task rate for each of the background tasks.
buzz	View buzzer status, enable/disable and turn on/off buzzer.
config	For express or automatic configuration. For advanced configuration please see the 'array' command.
ctrl	View or edit controller information and settings.
event	View or clear events logs.
export	Subsystems only. Export files to remote tftp host.
factorydefaults	Restore settings to factory defaults.
init	View logical drive initialization status and progress. Start, stop, pause, or resume an initialization.
logdrv	View or edit logical drive information and settings. Locate a logical drive via LEDs.
migrate	Start and monitor disk array migration process.
mp	View media patrol status and progress. Start, stop, pause, or resume media patrol.
phydrv	View or edit physical drive information and settings. Locate a physical drive via LEDs.
rb	View rebuild status and progress. Start, stop, pause, or resume a rebuild process.

Command	Action
rc	View redundancy check status and progress. Start, stop, pause or resume redundancy check.
spare	Create or modify hot spare drives.
spath	Discover and change subsystem path.
sync	View logical drive synchronization status and progress.
help	When used alone will display this menu. When used in conjunction with a command (example: help array) it will display help information for that particular command.
?	This can be used in place of the help command or optionally can be used as a switch for a command (example: array -?) to provide command usage.
Note: Commands are NOT case sensitive.	

Notes and Conventions

Commands and options are NOT case sensitive.

Not all extended keys are supported. However, you can use the backspace and the left and right arrow keys for command line editing. In addition, the up and down arrow keys allow scrolling through the command history buffer.

If you need context-sensitive help, type one of the following commands:

- <command> -h
- <command> -?
- help <command>

That action will display full context-sensitive help for the specific command.

Each command when used alone, such as “array” will display a summary of relevant information. If more information is desired, the -v verbose mode can be used. This will provide information for all relevant aspects of that command.

Usage terminology is as follows:

- [square braces] depict an optional switch
- <arrow braces> depict user input
- Type " | more" at the end of each command, to display info page by page

List of Supported Commands

- about (page 147)
- array (page 147)
- bga (page 150)
- buzz (page 152)
- config (page 153)
- ctrl (page 154)
- event (page 155)
- export (page 156)
- factorydefaults (page 157)
- init (page 157)
- logdrv (page 158)
- migrate (page 159)
- mp (page 160)
- phydrv (page 160)
- rb (page 161)
- rc (page 162)
- spare (page 163)
- spath (page 164)
- sync (page 165)

Note

If you choose an action that is not supported by the SuperTrak TX Series controller, the CLI returns a warning message. That response is normal and does not indicate a malfunction.

about

Usage

about

Summary

Displays utility information.

array

Usage

array [-a <action>] [-d <DaId>] [-c <array count>] [-v] array -a add [-s "<list of array params>"] [-d <DaId>] -p <PdId list> [-c <Ld count>] [-l "<list of Ld params>"] array -a mod -d <DaId> [-s "<list of array settings>"]

array -a del -d <DaId list>

array -a locate -d <DaId>

array -a accept -d <DaId> [-t <condition type>]

array -a addld -d <DaId> [-c <Ld count>] -l "<list of ld settings>"

array -a delld -l <LdId list>

array -a transport -d <DaId>

Summary

The array command is the main command for performing advanced configuration and maintenance tasks on disk arrays.

This command lists, creates, modifies, deletes, and locates disk arrays. It also adds and deletes logical drives.

Warning

When you delete a disk array, you delete the logical drives and all of the data on them. When you delete a logical drive, you delete all data on the logical drive. Backup any important data before you delete!

Options

-a <action>	Specifies the action to perform.
list	(Default) Displays a summary of all arrays, a specified number of arrays, or a specific array.
add	Adds/creates an array. This action might also create logical drives at the same time.
addld	Adds/creates a logical drive to an existing array.
delld	Deletes a logical drive from an array.
mod	Modifies array settings.
del	Deletes an array and all its associated logical drives.
locate	Locates an array.
accept	Accepts the condition of an incomplete array. Currently, there are two conditions that can cause an array to be incomplete: • "Missing Drive: One or more drives missing in the array When the either of the above conditions occurs, all the logical drives on the array go offline. You can accept the array in incomplete condition and try to bring the logical drives online. However, that is a high-risk and non-revertible operation, and it may result in data loss. Therefore, it is recommended to clear the condition first, for example: putting the missing drives back or roaming the array back to the original controller and wait until the migration completes.
transport	Takes the array and the logical drives on the array offline to get ready for transport the array to another subsystem.

-d <DA ID>	The disk array ID. Valid values are 0-255. Specifies the desired array ID when creating (add) an array. Specifies the array ID when listing array information, modifying, deleting, locating, accepting, adding or deleting a logical drive. Only one array may be specified.
-p <PD ID list>	Specifies physical drives to be used in an array, with -a add option. PD IDs are specified individually or separated by comma. Sequential group of physical drives are specified by placing a ~ between numbers such as 1~6. This will include physical drives 1, 2, 3, 4, 5, and 6.
-s "<option>=<value>"	Specifies array settings when creating (add) or modifying (mod) an array. Options are comma separated.
alias=	A user-specified array name. Up to 16 characters, alpha-numeric characters, blank spaces and underscores. Beginning and ending blank spaces are discarded.
mediapatrol=	Enables or disables Media Patrol for this array.
enable	The default is enable.
disable	
-l "<option>=<value>"	Specifies logical drive settings when adding a logical drive to an existing array (addld) or during array creation (add). Options are comma separated.
<LD ID list>	Specifies a list of Logical Drive IDs. Requires the -a delld option.
ID=	Assigns a specific ID to an array. Overrides automatic ID assignment. Valid values are 0-255.
Alias=	A user-specified name for the logical drive.
Raid=	Specifies logical drive RAID level.
0	Striping.
1	Mirroring on two drives.
10	Mirroring on even number of drives.
Capacity=	Specifies logical drive capacity. Can be specified in megabytes (mb), gigabytes (gb) or terabytes (tb), up to 2 decimal places. If not specified, all available capacity is used for this logical drive.
Stripe=	Specifies logical drive stripe size. Options include 64KB and 128 KB. If not specified, the default 64KB is used.
Sector=	Specifies logical drive sector size. Options include 512 B, 1 KB, 2 KB, and 4 KB. Sector size cannot exceed Stripe size. Auto-adjusted not to exceed the maximum supported sector size of the controller. See controller

	information on page 154. If not specified, the default 512 B is used.
Axle=	RAID10 has 2 axles, no options.
PreferredCtrlId=	Subsystems only. Specifies which controller the LD is preferred for LUN affinity. Valid value is 1 or 2. If value is not specified, LUN affinity is auto balanced.
-c <array count>	Specifies the number of arrays to give a summary of when used with the -a list option. For example 'array -a list -c3' will give a summary for the first 3 arrays on that controller.
<Ld count>	Specifies the number of logical drives to be created with the -a add option. With the -c option, all the logical drives have same settings but only one -l option=value can be specified.
-t <condition type>	Specifies the type of incomplete condition to accept. If not specified, it will accept the current incomplete condition by default.
missingdrive	The condition of missing drive in the array.
-v Verbose mode.	Displays all array properties, requires -a list option.

Examples

array -v -c 1

array -a add -s "mediapatrol=enable" -p 1,3,5~8

-l "raid=10,capacity=50gb,stripe=128kb,sector=1kb"

array -a add -p 1,3,5~8 -l "raid=10,capacity=50gb,stripe=256kb"

-l "raid=0,capacity=100gb"

array -a mod -d 1 -s "alias=YourArray,mediapatrol=disable"

array -a del -d 3

array -a locate -d 0

array -a accept -d 2

array -a addld -d 0 -l "raid=1,capacity=125gb"

array -a delld -l 1

bga

Usage

bga [-a <action>]

bga -a mod -s "<list of settings>"

Summary

The bga command displays all current background activities and makes settings each background activity.

Options

-a <action>	Specifies the action to perform.
list	(Default) Lists current background activities.
mod	Makes changes to one of the settings.
-s "<option>=<value>"	Specifies which background activity settings to change.
autorebuild=	Enable or disables auto-rebuild and auto-transition. Auto-rebuild will rebuild an array when an unconfigured drive is inserted into the slot of a dead drive. Auto-transition will start transitioning on a used revertible spare in the following condition: 1. When the rebuild has completed using the revertible spare, and 2. When an unconfigured drive is inserted into the slot of the dead drive which the was part of the array. or When a non-revertible spare has been inserted or created, and is applicable to the array. This option affects all arrays on the subsystem.
enable	
disable	
mediapatrol=	Verifies the media of the array and/or spares to find bad blocks on physical disks before you use that block. This feature is enabled and disabled on an array basis.
enable	
disable	
<bg task>=<rate>	Background task rates determine what percentage of the IO load on the controller should be dedicated to the background task. A lower number will mean the task takes longer to complete, a higher number will cause the task to complete faster, all other things being equal.
rebuildrate=	Rebuild rate determines the rate at which rebuild will run. (low=25, medium=50, high=75)
low	
medium	
high	

syncrate=	Synchronization rate determines the rate at which synchronization will run. (low=25, medium=50, high=75)
low	
medium	
high	
initrate=	Initialization rate determines the rate at which initialization will run. (low=25, medium=50, high=75)
low	
medium	
high	
migrationrate=	Migration rate determines the rate at which migration will run. (low=25, medium=50, high=75)
low	
medium	
high	

Examples

bga

bga -a mod -s "autorebuild=enable,rebuildrate=high,syncrate=low"

buzz

Usage

buzz [-a <action>]

buzz -a list

buzz -a enable

buzz -a disable

buzz -a on

buzz -a off

Summary

The buzz command displays the status of the buzzer, and enables, disables, turns on or turns off the buzzer.

Options

-a <action>	Specifies the action to perform.
list	(Default) List the status of the buzzer.
enable	Enable the buzzer.
disable	Disable the buzzer.

on	Turn on the buzzer.
off	Turn off the buzzer.

config

Usage

config -a auto

config -a expr [-r y|n] [-c y|n] [-p y|n] [-m y|n] [-s y|n] [-t <AppType>] [-l <NumLd>]

Summary

The config command has two options: Automatic and Express.

Automatic configuration takes all available unconfigured physical drives to create an optimized disk array following a default set of parameters. There are no options.

Express configuration takes your input, creates one or two arrays, and spreads their capacity evenly over all of the logical drives that you specify.

The redundancy option creates redundant logical drives (RAID 1 or 10).

The capacity option enables optimizes the logical drives for capacity.

The performance option optimizes the logical drives for performance.

If you choose all three options, redundancy gets highest priority and capacity gets lowest priority.

Options

-a <action>	Specifies the action to perform.
auto	Automatic configuration with no options. Creates an optimized disk array. One or more logical drives are created automatically.
expr	Express configuration. RAID level is dependant on the options chosen.
-r <y|n>	Selects the redundancy option.
-p <y|n>	Selects the performance option.
-c <y|n>	Selects the capacity option.
-m <y|n>	Allows mixing SATA and SAS physical drives in the same array.
-s <y|n>	Includes a spare drive in the array. Note: Requires 5 or more unconfigured physical drives.
-t <AppType>	Specifies the intended application for this array.
video	Stripe, 128 KB; Sector, 512 MB; ReadAhead, WriteThru.
data	Stripe, 64 KB; Sector, 512 MB; NoCache, WriteThru.

log	Stripe, 64 KB; Sector, 512 MB; ReadAhead, WriteBack.
other	Stripe, 64 KB; Sector, 512 MB; ReadAhead, WriteBack.
fileserver	Stripe, 64 KB; Sector, 512 MB; ReadAhead, WriteBack.
-l <num of LDs>	Specifies how many logical drives to include in the configuration. Array capacity is divided evenly among the logical drives.

Examples

config -a auto

config -a expr -ry -p y -c n -sy -t data -l2

ctrl

Usage

ctrl [-a <action>] [-i <ctrlId>] [-c <ctrl count>] [-v]

ctrl -a mod [-i <ctrlId>] -s "<list of settings>"

ctrl -a clear [-i <ctrlId>] [-t <condition type>]

Summary

The ctrl command displays controller information and changes controller settings.

Options

-a <action>	Specifies the action to perform.
list	(Default) Lists controller information.
mod	Changes controller settings.
clear	Clears controller conditions.
-i <ctrl ID>	Specifies the controller ID. For subsystems with dual controllers, controller ID is required when setting alias of controller.
-c <ctrl count>	Controller count. Required for information on multiple controllers.

Following setting is shared if there are dual controllers:

smart=	Enables or disables polling drive SMART status.
enable	
disable	
smartpollinginterval=	Sets the time interval in number of minutes to poll the drive SMART status.
1..1092	

cacheflushinterval=	Sets the time interval in seconds to flush the controller writeback cache.
1..12	
migrationstorage=	Sets location to store the migration watermark.
ddf	Uses the DDF area on the physical drives of the disk array.
nvram	Uses the NVRAM on the controller.
pollinterval=	Sets interval in seconds to poll enclosure SEP information.
15..255	
-t <condition type>	Specifies the type of condition to clear. Valid only when the command action is "clear".
-l	Displays the id of the controller on whose serial port the CLI is running.
-v	Verbose mode. Used with the -a list option.

Examples

ctrl

ctrl -v

ctrl -l

ctrl -a mod -i 1 smart=enable smartpollinginterval=50

event

Usage

event [-a <action>] [-l <location>] [-i <SeqNo>] [-c <event count>] [-v]

event -a clear [-l <location>]

Summary

The event command displays and clears the RAM and NVRAM event logs.

Options

-a <action>	Specified the action to perform.
list	Displays the events for the specified location. RAM events are displayed if no location is specified.
clear	Clear events for a specified location.
-l <location>	Specifies the location from which to display or clear events.
ram	All events are stored in RAM. These events are lost after rebooting.

nvram	Some events are also stored in NVRAM. These events remain after rebooting and are a subset of the RAM events.
-i <sequence ID>	Specifies a specific event by its sequence number. This is a starting point. Requires the -a list option. You can use the -c option.
-c <event count>	Specifies the number of events to retrieve when displaying events.
-v	Verbose mode. Requires the -a list option.

Examples

event

event -l nvram

event -a clear -lnvram

event -c 200

event -a list -i852 -c200

export

Usage

export -t <fileType> [-s <tftpServer>] [-p <port>] -f <fileName>

Summary

The export command exports certain types of configuration files to a remote or local host.

This command only affects subsystems.

Options

-t <file type>	Specifies the type of file to export.
userdb	User database file. This file type is not applicable for in-band and can only be exported to a remote host.
servicereport	System service report file. This file is exported to remote host for embedded and local host for in-band.
-f <file name>	Specifies the name of the file to be exported.
-s <TFTP server>	Specifies TFTP server's IP or host name. Do not specify TFTP server for in-band.
-p <port num>	The port number of the TFTP server. Default is 69. Do not specify port number for in-band.

Examples

export -t userdb -s 192.168.1.1 -f userdb.bin

export -t servicereport -s 192.168.1.1 -f servicereport

export -t servicereport -f servicereport

factorydefaults

Usage

factorydefaults -a <action> -t <type>

Summary

The factorydefaults command restores factory default settings.

Options

-a <action>	Specifies the action to perform.
restore	Restore the factory default settings.
-t <type>	Specifies the type of settings to restore.
all	All settings.
bga	Background activity settings.
ctrl	Controller settings.
encl	Enclosure settings.
phydrv	Physical drive settings.

Examples

factorydefaults -a restore -t phydrv

factorydefaults -a restore -t all

init

Usage

init [-a <action>] [-l <LdId>]

Summary

The init command starts, stops, pauses, and resumes a logical drive initialization.

A quick initialization writes to the first and last few megabytes of the logical drive. Typically, a quick initialization is completed in moments. Full initiation is not supported on the SuperTrak TX series.

Warning

When you initialize a logical drive, you delete all data on the logical drive. Backup any important data before you initialize!

Options

-a <action>	Specifies the action to perform.
list	Displays a list of the initializations in progress or paused and their status. The default action.
-l <LD ID>	Specifies the logical drive to be initialized.
-q <size>	Specifies the amount of data in megabytes (MB) for a quick initialization.
1..1024	

Examples

init

init -a start -l0 -q5

logdrv

Usage

logdrv [-a <action>] [-l <LdId>] [-c <Ld count>] [-v]

logdrv -a locate -l <LdID>

logdrv -a mod -l <LdId> -s "<list of ld settings>"

Summary

The logdrv command displays information about the logical drives and changes logical drive settings.

To create a logical drive, see the array command on page 147.

Options

-a <action>	Specifies the action to perform.
list	(Default) Displays a summary of one or more logical drives.
mod	Changes logical drive settings.
locate	Locates a logical drive within the enclosure by flashing drive carrier LEDs.
-l [<LD ID>]	Logical drive ID.
-c [<LD count>]	Logical drive count. Requires the -a list option.

-s ["<option>=<value>"]Specifies the logical drive settings to change.

alias=	A user-specified name for the logical drive. Up to 16 characters, containing alpha-numeric characters, blank spaces and underscores. Beginning and ending blank spaces are discarded.
-v	Verbose mode. Used with -a list.

Examples

logdrv

logdrv -v

logdrv -a locate -l2

migrate

Usage

migrate [-a <action>] [-d <DaId>]

migrate -a start -d <DaId> -p <PdIds> -l <LdSettings>

Summary

The migrate command expands the capacity of a logical drives (online capacity expansion) and changes logical drive RAID levels (RAID level migration).

Options

-a <action>	Specifies the action to perform.
list	(Default) Displays the migration status of specified disk array. If no array ID specified, all migration statuses are displayed.
start	Starts the migration.
-d <DA ID>	Specifies the ID of the array to be migrated.
-p <PD ID list>	Specifies the physical drives to be added to the array.
-l "<option>=<value>"	Specifies logical drive migration settings.
id=	(Required) Specifies the logical drive ID.
raid=	Specifies the new RAID level.

Examples

migrate -a start -d 1 -p 10 -l “id=0 raid=10”

mp

Usage

mp -a <action>

Summary

The mp command activates Media Patrol. Media Patrol searches the physical drives for media errors. When an error is found, Media Patrol attempts to repair the error. If it fails to correct the error, Media Patrol attempts to remap the sector. Note: Sector remapping is not currently supported.

You can start, stop, pause, or resume Media Patrol and monitor its progress and status.

Options

-a <action>	Specifies the action to perform.
list	(Default) Displays the status and progress of Media Patrol.
start	Starts Media Patrol.
stop	Stops Media Patrol.
pause	Pauses Media Patrol.
resume	Resumes a paused Media Patrol.

Examples

mp

mp -a stop

mp -a resume

phydrv

Usage

phydrv [-a <action>] [-p <PdId>] [-c <Pd count>] [-v]

phydrv -a mod -p <PdId> -s "<list of settings>"

phydrv -a locate -p <PdId>

phydrv -a online -p <PdId>

phydrv -a clear -t <condition type> -p <PdId>

Summary

The phydrv command displays physical drive information, changes physical drive settings, locates individual drives, and forces a drive to an online or offline state.

Options

-a <action>	Specifies the action to perform.
list	(Default) Displays all physical drives, their make, model number, and array they belong to. Their status is also shown.
mod	Modifies physical drive settings.
locate	Flashes the physical drive's LED so you can location it.
online	Forces a drive from an Offline to an Online state. **Caution:** Do this action only in extreme conditions. It causes data corruption in most cases.
-p <PD ID>	Specifies the physical drive ID.
-c <count>	Specifies number of drives when their ID numbers are sequential.
-v	Verbose mode. Used with -a list.

Examples

phydrv

phydrv -v

phydrv -a locate -p 9

phydrv -a online -p 8

rb

Usage

rb [-a <action>] [-d <DaId>] [-s <SeqNo>]

rb -a start -d <DaId> -s <SeqNo> -p <PdId>

rb -a stop -d <DaId> -s <SeqNo>

rb -a pause -d <DaId> -s <SeqNo>

rb -a resume -d <DaId> -s <SeqNo>

Summary

The rb command starts, stops, pauses, and resumes a Rebuild and monitors the progress of a running Rebuild.

Options

-a <action>	Specifies action to perform.
list	(Default) Displays the running and paused Rebuilds and their status.
start	Starts a manual Rebuild.

stop	Stops a Rebuild.
pause	Pauses a Rebuild.
resume	Resumes a paused Rebuild.
-d <DA ID>	Specifies which disk array on which to perform the Rebuild.
-s <sequence Num>	Specifies the sequence number of the failed physical drive. The source drive of the Rebuild.
-p <PD ID>	Specifies the ID of the replacement physical drive. The target drive of the Rebuild.

Examples

rb

rb -a start -d0 -s2 -p10

rb -a stop -d0 -s2

rc

Usage

rc [-a <action>] [-l <LdId>]

rc -a start -l <LdId> [-n] [-p]

rc -a stop -l <LdId>

rc -a pause -l <LdId>

rc -a resume -l <LdId>

Summary

The rc command starts, stops, pauses and resumes a Redundancy Check and monitors the progress of a running Redundancy Check.

Options

-a <action>	Specifies action to perform.
list	(Default) Displays active and paused Redundancy Checks and their status.
start	Starts a Redundancy Check.
stop	Stops a Redundancy Check.
pause	Pauses a Redundancy Check.
resume	Resumes a paused Redundancy Check.
-l <Ld ID>	Specifies the logical drive ID on which to run the Redundancy Check.

-n	Do not fix inconsistent data. This option causes Redundancy Check to run without correcting inconsistent data. All inconsistency errors are reported.
-p	Pause on error. This option causes Redundancy Check to pause when it encounters inconsistent data. The default is to continue on error.

Examples

rc

rc -a start -l3 -n -p

rc -a stop -l2

spare

Usage

spare [-a <action>]

spare -a list [-i <SpareId>] [-d <DaId>] [-v]

spare -a add [-i <SpareId>] -p <PdId> [-t g|d]

spare -a mod -i <SpareId> [-t g|d] [-d <DaId list>]

spare -a del -i <SpareId>

Summary

The spare command displays a list of hot spare drives and creates, modifies, and deletes hot spare drives.

A global hot spare can replace a failed drive from any redundant disk array.

A dedicated hot spare is assigned to one or more redundant disk arrays, and can only replace a drive that belongs to one of the assigned arrays.

The hot spare drive must be of equal or greater size than the drive it replaces.

Options

-a <action>	Specifies the action to perform.
list	(Default) Displays a list of hot spare drives.
add	Adds new hot spare drives.
mod	Changes hot spare drive settings.
del	Deletes a hot spare drive.
-i <Spare Id>	Specifies the ID of the spare drive.
-p <PD ID>	Specifies the ID of the physical drive. Requires the -a add option to configure a drive as a spare.

-d <DA ID or DA ID List>

	Specifies the disk array ID. Requires the -a list option. Displays a list of global spares and spares dedicated to this disk array. When used with other actions, it specifies the disk array IDs to which this spare is dedicated.
-t <type>	Specifies the type of hot spare drive.
g	A global hot spare drive.
d	A dedicated hot spare drive.

Examples

spare

spare -a add -p 14 -t g

spare -a del -i 0

spath

Usage

spath [-a list] [-t <type> -p <path #>]

spath -a discover

spath -a chgpath [-t <type> -p <path #>]

Summary

The spath command discovers and changes subsystem paths.

Options

-a <action>	Which action to perform.
list	(Default) Lists the subsystem paths that have been discovered.
discover	Discovers subsystem paths.
chgpath	Changes the current subsystem path to the new specified path. If -t <type> -p <path #> is not specified, it will list the current subsystem path.
-t <type>	Specifies the type of path.
hba	HBA.
subsys	Subsystem. With the -a list option, the default is both HBA and Subsystem. With the -a chgpath options, you must specify -t and -p to change the path. You cannot use the -t option with the -a discover option.

-p <path number>	Specifies the path number of the HBA and subsystem. The path number starts from 1.

Examples

spath

spath -a discover

spath -a chgpath -t subsys -p 1

sync

Usage

sync [-a <action>] [-l <LdId>]

Summary

The sync command monitors the progress of background synchronization.

Background synchronization makes logical drive consistent. It starts automatically when a redundant logical drive is created. But unlike initialization, background synchronization allows read and write operations on the logical drive. If an initialization starts, the background synchronization pauses until the initialization has finished.

Since background synchronization is starts, pauses, and resumes automatically, there is no need for start, stop, pause, or resume functions.

Options

-a <action>	Specifies the action to perform.
list	(Default) Displays active and paused synchronization and their status.
start	Starts a synchronization.
stop	Stops a synchronization.
pause	Pauses a synchronization.
resume	Resumes a paused synchronization.
list	(Default) Displays the current background synchronization activities and their status.
-l	Specifies the logical drive ID on which background synchronization is running.

Examples

sync

sync -a start -l3

sync -a list -l3

Chapter 7: Technology Background

- Introduction to RAID (below)
- Choosing a RAID Level (page 172)
- Choosing Stripe Block Size (page 174)
- Choosing Sector Size (page 174)
- Initialization (page 175)
- Hot Spare Drives (page 176)
- Partition and Format the Logical Drive (page 176)
- RAID Level Migration (page 176)
- Media Patrol (page 179)
- Critical & Offline Logical Drives (page 180)

Introduction to RAID

RAID (Redundant Array of Independent Disks) allows multiple physical drives to be combined together in a disk array. Then all or a portion of the disk array is formed into a logical drive. The operating system sees the logical drive as a single storage device, and treats it as such.

The RAID software and controller manage all of the individual drives. The benefits of a RAID can include:

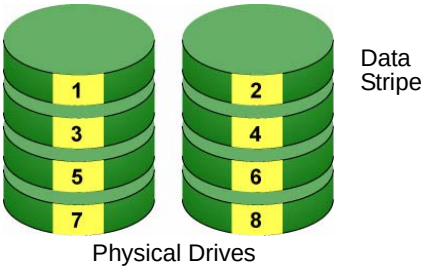
- Higher data transfer rates for increased server performance
- Increased overall storage capacity for a single drive designation (such as, C, D, E, etc.)
- Data redundancy/fault tolerance for ensuring continuous system operation in the event of a hard drive failure

Different types of logical drives use different organizational models and have varying benefits. Also see “Choosing a RAID Level” on page 172. The following outline breaks down the properties for each type of RAID logical drive:

RAID 0 – Stripe

When a logical drive is striped, the read and write blocks of data are interleaved between the sectors of multiple physical drives. Performance is increased, since the workload is balanced between drives or “members” that form the logical drive. Identical drives are recommended for performance as well as data storage efficiency.

Figure 1. RAID 0 Striping interleaves data across multiple drives



The logical drive's data capacity equals the capacity of the smallest physical drive times the number of physical drives. For example, one 100 GB and three 120 GB drives will form a 400 GB (4 x 100 GB) logical drive instead of 460 GB.

If physical drives of different capacities are used, there will also be unused capacity on the larger drives.

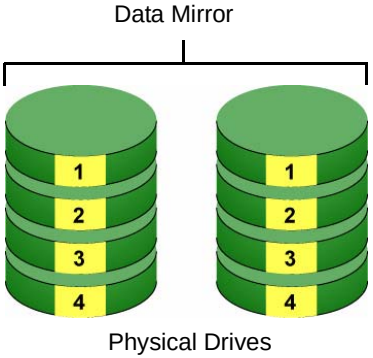
RAID 0 logical drives on SuperTrak consist of one or more physical drives.

RAID 1 – Mirror

When a logical drive is mirrored, identical data is written to a pair of physical drives, while reads are performed in parallel. The reads are performed using elevator seek and load balancing techniques where the workload is distributed in the most efficient manner. Whichever drive is not busy and is positioned closer to the data will be accessed first.

With RAID 1, if one physical drive fails or has errors, the other mirrored physical drive continues to function. Moreover, if a spare physical drive is present, the spare drive will be used as the replacement drive and data will begin to be mirrored to it from the remaining good drive.

Figure 2. RAID 1 Mirrors identical data to two drives



The logical drive's data capacity equals the smaller physical drive. For example, a 100 GB physical drive and a 120 GB physical drive have a combined capacity of 100 GB in a mirrored logical drive.

If physical drives of different capacities are used, there will be unused capacity on the larger drive.

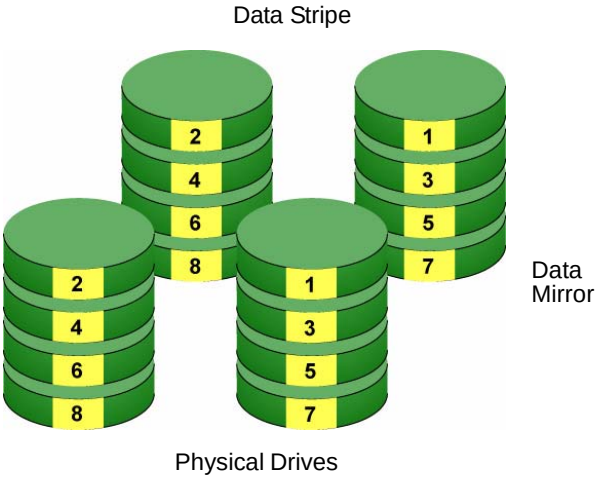
RAID 1 logical drives on SuperTrak consist of two physical drives.

If you want a mirrored logical drive with more than two physical drives, see "RAID 10 – Mirror / Stripe" on page 170 and "RAID 10 – Mirror / Stripe" on page 170.

RAID 10 – Mirror / Stripe

Mirror/Stripe combines both of the RAID 0 and RAID 1 logical drive types. RAID 10 is similar though not identical to RAID 0+1. It can increase performance by reading and writing data in parallel while protecting data with duplication. The data on one drive pair is mirrored together, then striped over a second drive pair.

Figure 3. RAID 10 takes a data mirror on one drive pair and stripes it over a second drive pair



The data capacity RAID 10 logical drive equals the capacity of the smallest physical drive times the number of physical drives, divided by two.

In some cases, RAID 10 offers double fault tolerance, depending on which physical drives fail.

RAID 10 arrays require an even number of physical drives and a minimum of four.

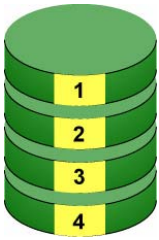
PassThru / Bypass Mode

PassThru/Bypass Mode is equivalent to a single-drive JBOD in other applications. It is not a RAID mode. The PC's operating system accesses the drive directly and the drive appears under disk management.

A drive set to PassThru/Bypass Mode does not appear as a logical drive in SuperBuild or WebPAM PRO.

There are no performance or fault-tolerance features. When a drive fails, all data on that drive is lost. Any other drives are unaffected.

Figure 4. PassThru/Bypass Mode is a physical drive setting



Physical Drive

Note that the SuperTrak TX controller supports up to 32 physical drives configured for RAID mode. Any additional drives configured for RAID Mode will become either Stale or Bypass Mode.

PassThru/Bypass Mode is a physical drive setting. See "Configuring Physical Drives" on page 69 or "Making Physical Drive Settings" on page 118.

Choosing a RAID Level

There are several issues to consider when choosing the RAID Level for your logical drive. The following discussion summarizes some advantages, disadvantages and applications for each choice.

RAID 0

Advantages	Disadvantages
Implements a striped logical drive, the data is broken down into blocks and each block is written to a separate physical drive I/O performance is greatly improved by spreading the I/O load across many channels and drives No parity calculation overhead is involved	Not a true RAID because it is not fault-tolerant The failure of just one drive will result in all data in an logical drive being lost Not suitable for mission critical environments

Recommended applications for RAID 0:

- Image Editing
- Pre-Press Applications
- Any application requiring high bandwidth

RAID 1

Advantages	Disadvantages
Simplest RAID storage subsystem design Can increase read performance by processing data requests in parallel since the same data resides on two different drives	Very high physical drive overhead – uses only 50% of total capacity

Recommended applications for RAID 1:

- Accounting/Financial
- Payroll
- Any application requiring very high availability

RAID 10

Advantages	Disadvantages
Implemented as a mirrored logical drive whose segments are RAID 0 logical drives High I/O rates are achieved thanks to multiple stripe segments	Very high physical drive overhead – uses only 50% of total capacity

Recommended applications for RAID 10:

- Imaging applications
- Database servers
- General fileserver

PassThru / Bypass Mode

Advantages	Disadvantages
Enables you to manage a large number of disk drives from a single controller The failure of one drive has no effect upon the data in other disk drives	Not a RAID – has no RAID qualities Not suitable for mission critical environments

Recommended Applications for PassThru/Bypass Mode:

- Any application where read/write speed or fault-tolerance are not important
- Applications were low-cost operation critical

Choosing Stripe Block Size

You set the stripe block size, also called block size, when you create a logical drive. With SuperTrak, the choices are 64 KB, and 128 KB. 64 KB is the default.

Your choice will directly affect performance. There are two issues to consider when choosing the stripe block size.

- Choose a stripe block size equal to or smaller than the smallest cache buffer found on any physical drive in your logical drive.

  A larger value slows the logical drive down because physical drives with smaller cache buffers need more time for multiple accesses to fill their buffers.
- If your data retrieval consists of fixed-size data blocks, such as some database and video applications, choose that data block size as your stripe block size.

Generally speaking, email, POS, and webservers prefer smaller stripe block sizes. Video and database applications prefer larger stripe block sizes.

See “Creating a Logical Drive” on page 74 or page 128, and “Creating a Disk Array – Advanced Configuration” on page 125.

Choosing Sector Size

You set the sector size when you create a logical drive. With SuperTrak, the choices are 512 B, 1 KB, 2 KB, and 4 KB. 512 B is the default.

A sector is the smallest addressable area on a physical drive. Sector Size refers to the size of sector measured by the number of bytes of data it can hold. The most common sector size is 512 bytes (512 B). A smaller sector size results in a more efficient use of a physical drive’s capacity. 512 B is the default sector size for logical drives on SuperTrak.

The number of usable sectors is limited by the addressing method of the computer's operating system:

- Windows XP (32-bit) support 10-bit logical bit addressing (LBA), so with 512 B sectors, they can only support up to 2 terabytes (TB) of data storage capacity. To increase the capacity, you must use larger sectors. See “2 TB Limitation” on page 175.
- Windows XP (64-bit), Windows Server 2003 and 2008, and Windows Vista support 64-bit LBA, so they are not affected by this limitation. For these OSes, always choose the default 512 B sector size.
- Linux operating systems with the 2.4 kernel do not support variable sector sizes. For these OSes, always choose the default 512 B sector size.

- Linux operating systems with the 2.6 kernel support 64-bit LBA. For these OSes, always choose the default 512 B sector size.

See “Creating a Logical Drive” on page 74 or page 128, and “Creating a Disk Array – Advanced Configuration” on page 125.

2 TB Limitation

If your Host PC runs Windows XP (32-bit), and you want to create logical drives larger than 2 TB, you must choose a sector size larger than 512 B when you create the logical drive. The table on the next page correlates sector size with logical drive capacity.

Logical Drive Size	Sector Size
8 to 16 TB	4096 bytes (4 KB)
4 to 8 TB	2048 bytes (2 KB)
2 to 4 TB	1024 bytes (1 KB)
0 to 2 TB	512 bytes (512 B)

Also see “Ranges of Disk Array Expansion” on page 178.

Initialization

Initialization is highly recommended for logical drives when they are created from a disk array. Initialization sets all data bits in the logical drive to zero. The action is useful because there may be residual data on the logical drives left behind from earlier configurations. You can also perform an Initialization on an existing logical drive.

Warning

When you initialize a logical drive, all the data the logical drive will be lost. Backup any important data before you initialize a logical drive.

There are two options for logical drive initialization:

- **Quick** – Overwrites the data bits on the first and last blocks of logical drive. Takes only seconds.
- **None** – Not recommended.

Full initialization, where all data bits of all blocks of the logical drive are set to zero, is not supported on the SuperTrak TX series.

See “Creating a Logical Drive” on page 74 or page 128, “Creating a Disk Array – Advanced Configuration” on page 125, and “Initializing a Logical Drive” on page 135.

Hot Spare Drives

A hot spare is a physical drive that is available to a disk array but not actually a part of it. In the event of the failure of a physical drive, the hot spare is activated as a member of the disk array to replace the failed drive.

SuperTrak will replace a failed physical drive in a disk array with a hot spare drive, if one is available. There are two types of hot spare drive:

- **Global** – An unassigned physical drive available to any logical drive on the Host PC.
- **Dedicated** – An unassigned physical drive that can only be used by a specified logical drive.

Whenever possible, having a hot spare drive in your RAID system is good protection against physical drive failure. Even though the hot spare drive is assigned to a disk array, the rebuild operation is said to apply to a logical drive.

Partition and Format the Logical Drive

Like any other type of fixed disk media in your system, a RAID logical drive must also be partitioned and formatted before use. Use the same method of partitioning and formatting on an logical drive as you would any other fixed disk.

See “Appendix A: Partition and Format” on page 207.

RAID Level Migration

To *migrate* a disk array is to do one or both:

- Change its RAID level
- Increase the number of physical drives (sometimes called *expansion*)

On SuperTrak, RAID level migration is performed on the disk array but it applies to the logical drives. Migration takes place on an existing Functional disk array without disturbing the existing data. While the disk array is migrating, you can access the data as before. When migration is complete, your disk array will have a different RAID level and/or a larger capacity.

In most cases, you must add one or more physical drives during the migration process. You can never reduce the number of physical drives.

The tables below shows the migration options for a source logical drive according to its RAID level. The available target RAID levels are shown with their requirements.

You must use WebPAM PRO to migrate a disk array. See “Migrating a Disk Array” on page 130.

RAID 0

A RAID 0 source logical drive can migrate to the following target logical drives:

Target	Requirements
RAID 0	Add physical drives.
RAID 1	2 physical drives only. Only a single-drive RAID 0 can migrate to RAID 1 by adding 1 physical drive.
RAID 10	4 physical drives minimum. Even number of physical drives.

RAID 1

A RAID 1 Source logical drive can migrate to the following Target logical drives:

Target	Requirements
RAID 0	None.
RAID 10	4 physical drives minimum. Even number of physical drives.

RAID 10

A RAID 10 Source logical drive can migrate to the following Target logical drives:

Target	Requirements
RAID 0	None.
RAID 10	Add physical drives. Even number of physical drives.

Important

- The Target disk array may require more physical drives than the Source disk array
- If the Target disk array requires an EVEN number of physical drives but the Source disk array has an ODD number, ADD a physical drive as part of the migration process
- You cannot reduce the number of physical drives in your disk array, even if the Target disk array requires fewer physical drives than the Source disk array
- RAID 1 (mirroring) works with two drives only. Only a single-drive RAID 0 disk array can migrate to RAID 1. Other RAID Levels use too many drives to migrate
- You cannot migrate a disk array when it is Critical or performing activities such as Synchronizing or Rebuilding
- You cannot migrate to or from PassThru/Bypass Mode.

Ranges of Disk Array Expansion

The Windows XP (32-bit) operating systems support a 10-byte LBA format. As a result, these OSes can only recognize 4 billion addresses. If you create a logical drive using the default 512 B sector size, the logical drive will be limited to 2 TB of data, even if there is more space available on your physical drives.

This limitation does not apply to Windows XP (64-bit), 2003 Server, Vista, and Linux OSes with the 2.6 kernel. Linux OSes with the 2.4 kernel do not support variable sector sizes, therefore you cannot apply the solution described here to those OSes.

Note that once you create your logical drive, you cannot change the size of the sectors. Nor can you increase the number of address blocks that the OS recognizes.

You can direct WebPAM PRO to expand a logical drive beyond the maximum expansion size. When the expansion is finished:

- WebPAM PRO will show the logical drive in the desired size.
- Your operating system might show the logical drive at the maximum size listed in the table below.
- Additional capacity might appear as unpartitioned and unformatted.

Current LD Size	Maximum LD Expansion Size	Sector Size
8 to 16 TB	16 TB	4096 bytes
4 to 8 TB	8 TB	2048 bytes
2 to 4 TB	4 TB	1024 bytes
up to 2 TB	2 TB	512 bytes

At this point, you have the choice of:

- Format the unpartitioned/unformatted capacity as a *second* logical drive
- Delete the existing disk array and create a new one in the desired size

Delete and Recreate

If you require a logical drive larger than the maximum expansion size:

1. Backup the data from the current logical drive.
2. Delete the current logical drive.
   See “Deleting a Logical Drive” on page 76 or page 129.
3. Create a new logical drive with the desired capacity.
   See “Creating a Logical Drive” on page 74 or page 128.
4. Restore the data to the new logical drive.

Media Patrol

Media Patrol is a routine maintenance procedure that checks the magnetic media on each physical drive. Media Patrol checks all physical drives assigned to disk arrays and on spare drives. Media Patrol does not check unconfigured drives.

Unlike Synchronization and Redundancy Check, Media Patrol is concerned with the condition of the media itself, not the data recorded on the media.

You can run Media Patrol from the subsystem. See “Running Media Patrol” on page 108.

You can also run Media Patrol on a disk array. See “Running Media Patrol on a Disk Array” on page 132.

Critical & Offline Logical Drives

A fault-tolerant logical drive—RAID 1 or 10—goes *critical* when a physical drive is removed or fails. Due to the fault tolerance of the logical drive, the data is still available and online. However, once the logical drive goes critical, the logical drive has lost its fault tolerance, and performance may be adversely affected.

If the fault was caused by a failed drive that was removed, the drive must be replaced by another drive, either identical or larger, in order for the RAID system to rebuild and restore optimal configuration.

If your fault-tolerant logical drive—RAID 1 or 10—goes *offline*, contact Technical Support. See page 199.

Warning

Take no further corrective action until you have consulted with Technical Support. See page 199.

A non-fault tolerant logical drive—RAID 0—goes *offline* when a physical drive is removed or fails. Since the logical drive is not fault tolerant, the data stored in the logical drive is no longer accessible.

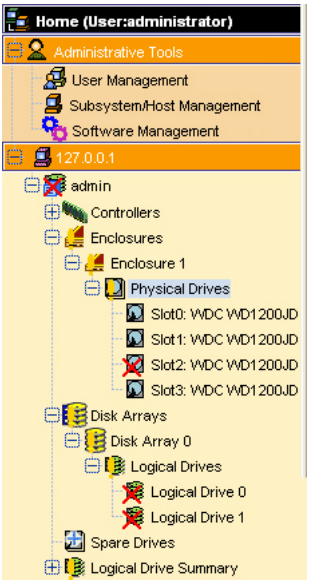
If one physical drive fails, all of the data on the logical drive is lost. You must replace the failed drive. Then, if the logical drive had more than one physical drive, delete the logical drive and re-create it. Restore the data from a backup source.

When a Physical Drive Fails

The SuperTrak TX Controller provides both audible and visual indicators to alert you of a physical drive failure. The following will occur when a physical drive fails or goes offline, WebPAM PRO reports the condition.

WebPAM PRO aids in troubleshooting your logical drives and enclosure by continuous monitoring and reporting to the User in the following ways:

- Displays yellow !s red Xs in Tree View (right)
- Sends email messages, per your configuration
- Displays popup messages, per your configuration (below)



7 New Events X
Last Event: 29, DA 0, Major, May 12, 2005 13:28:02
Logical drive has been set to critical

- Keeps a record in the Event Log (below)

Thu, May 12, 2005 13:30:50 Max Events Display 10

#	Device	Event ID	Severity	Time	Description
34	DA 0	0x000F0001	Info	May 12, 2005 13:28:47	Rebuild is completed
33	LD 0	0x00090006	Info	May 12, 2005 13:28:47	Rebuild marks the logical drive synchronized upon rebuild completion
32	LD 0	0x00090002	Info	May 12, 2005 13:28:47	Logical drive has been placed online
31	DA 0	0x000F0000	Info	May 12, 2005 13:28:03	Rebuild is started
30	PD 5	0x000D000B	Info	May 12, 2005 13:28:02	Physical Disk has been removed
29	LD 0	0x00090004	Major	May 12, 2005 13:28:02	Logical drive has been set to critical
28	PD 5	0x000D001A	Major	May 12, 2005 13:28:02	Physical Disk is marked as DEAD due to removal
27	Spare 0	0x001D0001	Info	May 12, 2005 02:00:26	Spare check completed successfully on the given spare drive
26	Spare 1	0x001D0001	Info	May 12, 2005 02:00:26	Spare check completed successfully on the given spare drive
25	Spare 0	0x001D0000	Info	May 12, 2005 02:00:26	Spare check started on the given spare drive

With a Hot Spare Drive

When a physical drive in a logical drive fails and a spare drive of adequate capacity is available, the disk array will begin to rebuild automatically using the spare drive. This function is always enabled.

After the logical drive rebuilds itself using the spare drive, you must replace the failed drive.

To set up a spare drive, see “Creating a Spare Drive” on page 78 or page 137.

Without a Hot Spare Drive

If there is no hot spare drive of adequate capacity, you must remove the failed drive and install an unconfigured replacement drive of the same or greater capacity in the same slot as the failed drive. Until you install the replacement drive, the logical drive will remain Critical.

- If the Auto Rebuild function is ENABLED, the disk array will begin to rebuild automatically as soon as you replace the failed drive.
- If the Auto Rebuild function is DISABLED, you must manually rebuild the disk array after you replace the failed drive.

To enable Automatic Rebuild, see “Making Background Activity Settings” on page 107.

To set Hot Spare Policy, see “Making Spare Drive Settings” on page 139.

Rebuild Operation

During rebuild:

- The alarm sounds two short beeps, repeated
- No warning icon displays over the disk array or logical drive icons

  Management View reports the disk array’s Operational Status as OK, Rebuilding.

During rebuilding, you can still read and write data to the logical drive. However, fault tolerance is lost until the disk array returns to OK (not-rebuilding) status.

After a successful rebuild:

- The alarm is silent
- The logical drive’s Operational Status is OK
- The rebuilt physical drive Status LED displays steady green

Chapter 8: Troubleshooting

- Problem Reports from SuperTrak
  - Buzzer (page 183)
  - LEDs (page 183)
  - BIOS (page 185)
- Problems Reported in WebPAM PRO (page 187)
- Critical & Offline Logical Drives (page 189)
- Rebuilding a Logical Drive (page 191)
- Recovering from a Blank Screen (page 193)

Problems Reported by SuperTrak

The SuperTrak TX Controller provides both audible and visual indicators to alert you to a problem.

Buzzer

The buzzer sounds to inform you that your RAID system needs attention. But the buzzer does not specify the condition. When a continuous tone sounds, there are multiple alarm patterns sounding at the same time.

When the buzzer sounds, take the following actions:

- Check your disk arrays and logical drives.
- Check the Event Log. See “Viewing the Event Frame” on page 89 or “Viewing the Runtime Event Log” on page 104.

LEDs

If your system is configured with Global LEDs or Direct LEDs, they will indicate when a problem is present. Use the SuperBuild utility or WebPAM PRO to further diagnose and correct the problem.

Global LED Display

Global LEDs glow in response to Logical Drive status.

LED	Logical Drive Status
Dark	System off
Green	Normal
Amber	Logical Drive Critical
Red	Logical Drive Offline

Direct LED Display

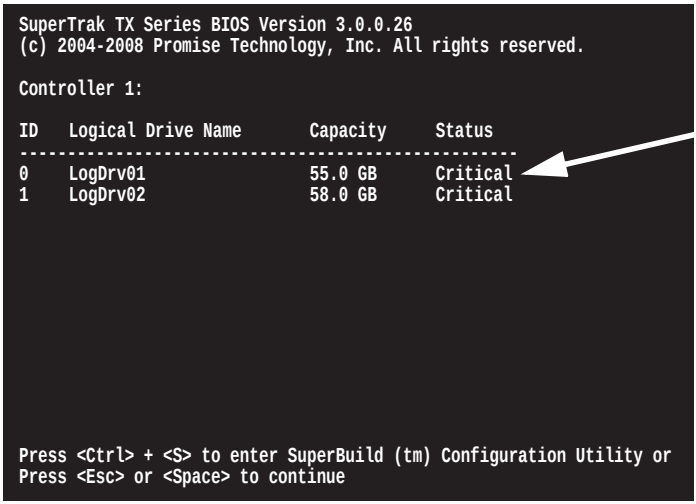
Direct LEDs, glow and blink in response to the SuperTrak's firmware status.

Fault LED	Activity LED	Firmware Status
OFF	OFF	No physical drive
ON	ON	Unconfigured physical drive
OFF	ON	Configured physical drive – Status OK
ON	ON	Configured physical drive – Status Not OK
OFF	ON	Global spare drive – Status OK
ON	ON	Physical drive – Status Dead
ON	ON	Stale condition
Blink	ON	Rebuilding
OFF	Blink	Activity
Blink	ON	Locate physical drive
Blink	ON	Locate logical drive
Blink	ON	Locate disk array

BIOS

The problem is first reported in the SuperTrak BIOS screen when you boot your PC or server, as shown below.

Figure 1. SuperTrak BIOS screen, logical drive critical

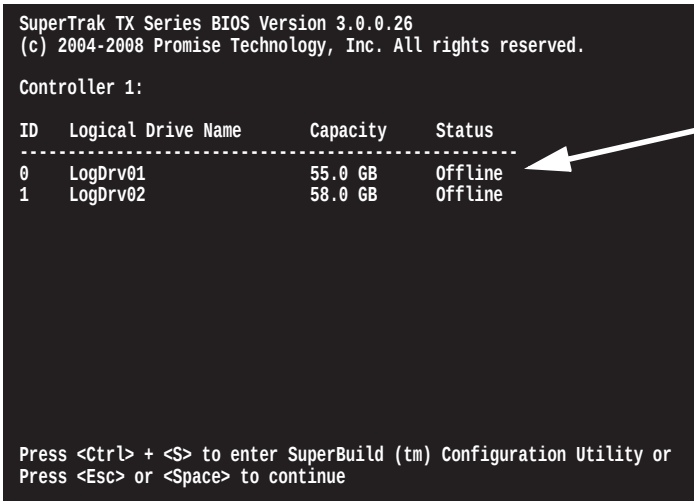

SuperTrak TX Series BIOS Version 3.0.0.26
(c) 2004-2008 Promise Technology, Inc. All rights reserved.
Controller 1:
ID Logical Drive Name Capacity Status
0 LogDrv01 55.0 GB Critical
1 LogDrv02 58.0 GB Critical
Press <Ctrl> + <S> to enter SuperBuild (tm) Configuration Utility or
Press <Esc> or <Space> to continue

If the SuperTrak BIOS detects an *Critical* logical drive, the BIOS reports the condition but allows the booting process of the Host PC to continue.

Choose a Management application:

- Press Ctrl-S at the BIOS screen to open the SuperBuild utility.
- Allow your OS to boot, then open WebPAM PRO.

Figure 2. SuperTrak BIOS screen, logical drive offline


SuperTrak TX Series BIOS Version 3.0.0.26
(c) 2004-2008 Promise Technology, Inc. All rights reserved.
Controller 1:
ID Logical Drive Name Capacity Status
0 LogDrv01 55.0 GB Offline
1 LogDrv02 58.0 GB Offline
Press <Ctrl> + <S> to enter SuperBuild (tm) Configuration Utility or
Press <Esc> or <Space> to continue

If the SuperTrak BIOS detects an *Offline* logical drive, the BIOS reports the condition and temporarily halts the booting process of the Host PC.

Choose a Management application:

- Press Ctrl-S to open the SuperBuild utility.
- Press the Space bar, allow your OS to boot, then open WebPAM PRO.

Problems Reported in WebPAM PRO

Open WebPAM PRO

If WebPAM PRO is not running, do the following actions:

1. Open WebPAM PRO.

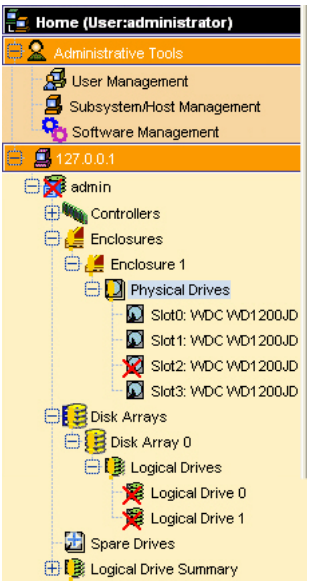
   See “Logging into WebPAM PRO” on page 83 for more information.

2. Click Subsystem in Tree View.
3. Click Enclosures and its subordinates.
4. Click Disk Arrays and its subordinates.

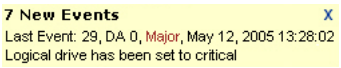
What to Look For

When a logical drive goes critical or offline, WebPAM PRO reports the condition in the following ways:

- Displays yellow !s red Xs in Tree View (below)



- Sends email messages, per your configuration
- Displays popup messages, per your configuration (below)



- Keeps a record in the Event Log (below)

Thu, May 12, 2005 13:30:50 Max Events Display 10

#	Device	Event ID	Severity	Time	Description
34	DA 0	0x000F0001	Info	May 12, 2005 13:28:47	Rebuild is completed
33	LD 0	0x00090006	Info	May 12, 2005 13:28:47	Rebuild marks the logical drive synchronized upon rebuild completion
32	LD 0	0x00090002	Info	May 12, 2005 13:28:47	Logical drive has been placed online
31	DA 0	0x000F0000	Info	May 12, 2005 13:28:03	Rebuild is started
30	PD 5	0x000D000B	Info	May 12, 2005 13:28:02	Physical Disk has been removed
29	LD 0	0x00090004	Major	May 12, 2005 13:28:02	Logical drive has been set to critical
28	PD 5	0x000D001A	Major	May 12, 2005 13:28:02	Physical Disk is marked as DEAD due to removal
27	Spare 0	0x001D0001	Info	May 12, 2005 02:00:26	Spare check completed successfully on the given spare drive
26	Spare 1	0x001D0001	Info	May 12, 2005 02:00:26	Spare check completed successfully on the given spare drive
25	Spare 0	0x001D0000	Info	May 12, 2005 02:00:26	Spare check started on the given spare drive

Critical & Offline Logical Drives

A fault-tolerant logical drive—RAID 1 or 10—goes *critical* when a physical drive is removed or fails. Due to the fault tolerance of the logical drive, the data is still available and online. However, once the logical drive goes critical, the logical drive has lost its fault tolerance, and performance may be adversely affected.

If the fault was caused by a failed drive that was removed, the drive must be replaced by another drive, either identical or larger, in order for the RAID system to rebuild and restore optimal configuration.

If your fault-tolerant logical drive—RAID 1 or 10—goes *offline*, contact Technical Support. See page 199.

Warning

Take no further corrective action until you have consulted with Technical Support. See page 199.

A non-fault tolerant logical drive—RAID 0—goes *offline* when a physical drive is removed or fails. Since the logical drive is not fault tolerant, the data stored in the logical drive is no longer accessible.

If one physical drive fails, all of the data on the logical drive is lost. You must replace the failed drive. Then, if the logical drive had more than one physical drive, delete the logical drive and re-create it. Restore the data from a backup source.

Finding the Failed Drive in SuperBuild

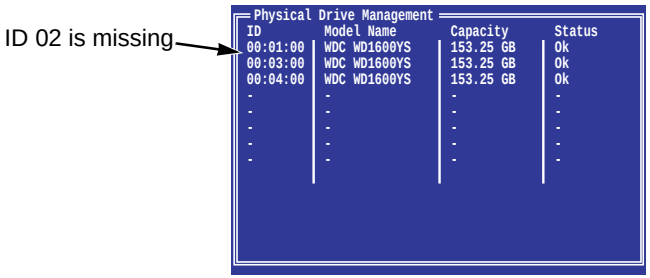
To identify a failed physical drive:

1. In the Main Menu, highlight *Physical Drive Management* and press Enter.

   The Physical Drive Management screen displays.

2. Compare the list of physical drives on the screen against the actual physical drives attached to the SuperTrak controller.

Figure 3. Physical Drive Management screen

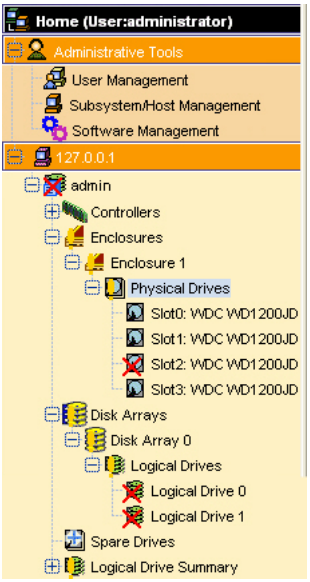


In the example above, there is no physical drive for ID 00:02:00. Assuming you installed a physical drive onto Channel 2 of the SuperTrak controller, this is the failed drive.

3. Shut down the Host PC, open the case, check the power and data connections to each physical drive, correct any shortcomings, restart the Host PC and check in SuperBuild again.

Finding the Failed Drive in WebPAM PRO

To locate a failed or missing physical drive:



1. Open WebPAM PRO.

   See “Logging into WebPAM PRO” on page 83 for more information.

2. Click Subsystem in Tree View.
3. Click Enclosures.
4. Click Enclosure 1.
5. Click Physical Drives.
6. Examine the list of physical drives.
   - If a drive was present but is now missing, that is the failed drive. Check the power and data connections. If those are OK, you must replace the drive.
   - If a drive is marked as Stale when you configure more than 32 physical drives for RAID mode.
   - If a drive is marked as Dead, that is the problem drive and you must replace it.

Rebuilding a Logical Drive

The remedial action for a Critical logical drive is to rebuild it, meaning the data from the failed physical drive is rebuilt onto a spare or replacement physical drive.

Spare Drive Available

The SuperTrak Controller will rebuild a Critical logical drive automatically using a spare drive, providing:

- A spare drive is available
- The spare drive is the same size or larger than the failed drive

If the above conditions are met, the SuperTrak controller automatically rebuilds the logical drive with the hot spare. This function is always enabled.

After the rebuild is done, you must replace the failed drive with a new physical drive.

See “Creating a Spare Drive” on page 78 or page 137. Also see “Hot Spare Drives” on page 176.

No Spare Drive Available

If a spare drive is not available, you must replace the failed drive. Then the SuperTrak controller will automatically rebuild the logical drive using the new physical drive, providing:

- You replace the failed drive with a new drive of the same size or larger
- The Auto Rebuild setting is enabled in WebPAM PRO. Enabled is the default setting. See “Making Background Activity Settings” on page 107.

Manual Rebuild: SuperBuild Utility

In some cases, you must start the Rebuild manually. After replacing the failed drive with a new drive of equal or larger size, take the following actions:

1. In the Main Menu, highlight *Disk Array Management* and press Enter.
   The Disk Array Management screen displays.
2. Highlight the Disk Array with the failed drive and press Enter.
   The Disk Array Info and Setting screen displays.
3. Highlight Physical Drives in the Array and press Enter.
   Note the ID numbers of the physical drives that are still functional
4. Highlight *Start Manual Rebuild* and press Enter.
   The Manual Rebuild screen displays.

5. Highlight the *Source Sequence Number* and press Enter. Then type the ID number of one of the physical drives you noted in step 3 and press Enter.
6. Highlight the *Target Physical Drive ID* and press Enter. Then type the ID number of the new drive and press Enter.
7. Highlight *Start Manual Rebuild* and press Enter.

   The time required for the Rebuild depends on the number and size of your logical drives. You can monitor the progress of the Rebuild under Background Activity.

Manual Rebuild: WebPAM PRO

If a physical drive has failed, identify and replace the drive, then rebuild the disk array as described below:

1. Click Subsystem in Tree View.
2. Click Disk Arrays.
3. Click Disk Array.

   If there are multiple disk arrays, choose the icon with the yellow !.
4. From the dropdown menu on the Background Activity tab, choose *Start Rebuild*.
5. Choose the Source physical drive.

   This is a remaining functional physical drive in the disk array.
6. Choose the Target physical drive.

   This is the replacement physical drive.
7. Click the **Submit** button.

The Disk Array Background Activity tab will show the rebuild the replacement (target) physical drive. Depending the size of the physical disk involved, this process will take some time.

To view more information, click the **Rebuild on PDx** link.

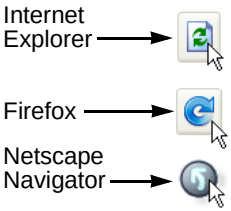
To set Rebuild priority, see “Making Background Activity Settings” on page 107.

Recovering from a Blank Screen

Occasionally, while you are performing a RAID management operation using WebPAM PRO, your browser screen might go blank.

To recover from a blank browser screen, do one of the following actions:

- Press the F5 key.
- Click your browser's **Refresh** button (right).



Chapter 9: Support

- Frequently Asked Questions (below)
- Contacting Technical Support (page 199)
- Limited Warranty (page 202)
- Returning the Product For Repair (page 204)

Frequently Asked Questions

This section lists frequently asked questions involving pre-installation, drive issues, installation, and post-installation.

Pre-Installation (Speed, Device Types, Capacity, Cabling)

What kind of HDDs can I use for a SuperTrak TX Series logical drive?

You can use any Serial Attached SCSI (SAS) or Serial ATA (SATA) hard disk drive from the *compatibility list* on the Promise Support Website. Use matching drives for multiple-drive arrays to maximize capacity usage as well as performance.

What is the maximum physical drive storage capacity of SuperTrak TX Series?

The SuperTrak TX8650 and TX8658 support up to 6.0 TB (eight 750 GB physical drives).

The SuperTrak TX Series controllers also support up to 116 SAS physical drives per SAS port using SAS expanders.

Can I use ATAPI devices on the SuperTrak TX Series?

No. The SuperTrak TX Series Controller does not support ATAPI devices.

Will ACPI work with HDDs on the SuperTrak TX Series?

Yes. The SuperTrak TX Series controller supports ACPI S1, S3 and S4 standby modes.

What kind of PCI slots do the SuperTrak TX Series controllers use?

SuperTrak TX Series controllers will work in a PCI-Express x8 slot or x16 slot.

How can I change the resources that the SuperTrak uses?

The SuperTrak TX Series Controllers are fully PnP. This means all the resources that it uses are given to it by the PnP BIOS on the motherboard.

The SuperTrak Series Controller supports IRQ sharing, but this feature only works when ALL the concerned devices support it. If your motherboard allows you to control the assignment of these resources, you may be able to remedy the problem by:

- Changing the IRQ assignments to the PCI slots in the motherboard BIOS during boot up.
- Reset the configuration data in your CMOS. This is usually an option in the PnP section of your CMOS.
- Otherwise, switch the SuperTrak Controller card to a different PCI slot.

Drive Issues

Can I add a drive to a SuperTrak TX Series logical drive via hot-swap and dynamically adjust the array size/configuration?

Yes. The SuperTrak TX Series controller supports online logical drive expansion and migration. You must use the SuperBuild utility or the WebPAM PRO software to expand or migrate an existing logical drive.

Do the HDDs on the SuperTrak TX Series have to be the same size?

The physical drives that you use with the SuperTrak TX Series controller do not have to be the same size. If the sizes differ, the SuperTrak TX Controller will truncate the large drive so the capacities match. The resulting difference in drive space is unusable, so avoid using physical drives of significantly different capacities.

Can I take a drive used in a SuperTrak TX Series logical drive and access it directly with a different controller, such as the one integrated on the motherboard?

Yes, but only under certain configurations. First, the other controller must address the drives as LBA, not CHS.

Second, only the following configurations allow the drive(s) to be accessed individually on another controller:

- Single-drive RAID 0 (stripe)
- One drive from a RAID 1 (mirror) logical drive

No other array configurations will work for this purpose.

I already have an array on a Promise FastTrak controller. Can I move that array to my new SuperTrak TX Series controller?

No. The SuperTrak TX Series controller supports SNIA Disk Data Format (DDF), which is not backward compatible with the FastTrak controller.

If I have a problem with one of the drives on the SuperTrak TX Series, how can I low-level format it to correct the problem?

Do NOT do this! Low-level formatting hard physical drives is not only unnecessary but it generally does not correct problems commonly experienced during use.

Errors such as bad sectors or ECC/CRC failure are best remedied by completely replacing the drive. For this reason, do NOT low-level format the drives attached to the SuperTrak TX Series controller.

Do I have to install disk management software on my logical drive in order to access the full storage capacity of drives?

No! Disk management software will only complicate things. The logical drive should be fully addressable by your OS as it is. Some operating systems have limits on the sizes of partitions and logical drives that can be defined. Consult your OS documentation about partitioning larger drives.

What system BIOS setup settings do I use for the drives on the SuperTrak TX Series?

A BIOS setting is required only if you want to boot your system from the logical drive on the SuperTrak TX Series controller. After your logical drive is created, partitioned and formatted, make the change in your BIOS boot order setting.

How do I partition/format my SuperTrak TX Series RAID logical drive?

The SuperTrak TX Series controller represents the logical drive as a single physical drive to your system. Therefore, anything that you can do to a single physical drive you can do to a SuperTrak logical drive.

For example, you should use the FDISK and FORMAT utilities to partition and format the logical drive. You can format the logical drive with any file system you wish.

Installation Issues (Capacity, Booting)

How can I change the system boot sequence in order to boot from the SuperTrak TX Series logical drive?

The boot sequence is controlled by the system BIOS. As far as the system BIOS is concerned, the SuperTrak TX Controller and defined logical drives

are categorized as a SCSI device. This allows you to set the boot sequence in your BIOS setup utility to boot from SCSI first, rather than IDE.

If there are multiple SCSI add-in controllers in the system, then the boot sequence among them will be determined exclusively by their PCI slot priority. PCI slot #1 will be first, slot #2 second, etc. Put the SuperTrak TX Controller in the PCI-Express slot where it will be accessed ahead of other SCSI controllers if you want to boot from the logical drive.

How can I change the boot sequence between a PCI SCSI card and the SuperTrak TX Series RAID logical drive?

Since all PCI-Express are PnP, it is difficult to determine which device is addressed first. Most motherboard BIOSes have advanced options that identify devices and allow you to choose which device will be assigned resources first. Otherwise you may have to physically switch the device cards on the PCI/PCI-Express/PCI-X slots so that the boot device is in the highest priority slot number (see previous question).

Post-Installation

Why can't I see the drives on the SuperTrak TX Series under FDISK?

You have not created a logical drive yet. Without a logical drive, the system will not recognize the physical drives attached to the SuperTrak TX Controller.

A physical drive is recognized by the SuperTrak controller but not available to use in a disk array. How can I make it available?

The physical drive might contain obsolete disk array information. See "Managing Disk Arrays" on page 120. This action clears the obsolete information in order to make the drive available.

Why can't I run WebPAM PRO in Konqueror?

The Konqueror browser (Linux) does not support WebPAM PRO. Install a Netscape Navigator or Firefox browser. With that browser as the default, reinstall WebPAM PRO.

Aren't the WebPAM PRO icons supposed to be animated?

Yes, they are animated. However, the default setting for Internet Explorer under Windows 2003 Server does not display animation in the browser. Go to Internet Options > Advanced and check *Play animations in web pages*.

Contacting Technical Support

Promise Technical Support provides several support options for Promise users to access information and updates. We encourage you to use one of our electronic services, which provide product information updates for the most efficient service and support.

If you decide to contact us, please have the following information available:

- Product model and serial number
- BIOS and driver version numbers
- A description of the problem / situation
- System configuration information, including: motherboard and CPU type, hard drive model(s), SAS/SATA/ATA/ATAPI drives & devices, and other controllers.

Technical Support Services

Promise Online™ Web Site	http://www.promise.com/support/support_eng.asp. (technical documents, drivers, utilities, etc.)

United States

E-mail Support	e-Support On-Line
Fax Support	+1 408 228 1100 Attn: Technical Support
Phone Support	+1 408 228 1400 option 4
If you wish to write us for support:	Promise Technology, Inc. 580 Cottonwood Drive Milpitas, CA 95035, USA

The Netherlands

E-mail Support	e-Support On-Line
Fax Support	+31 0 40 256 9463 Attn: Technical Support
Phone Support	+31 0 40 235 2600
If you wish to write us for support:	Promise Technology Europe B.V. Science Park Eindhoven 5542 5692 EL Son, The Netherlands

Germany

E-mail Support	e-Support On-Line
Fax Technical Support	+49 0 2 31 56 76 48 29 Attn: Technical Support
Phone Technical Support	+49 0 2 31 56 76 48 10
If you wish to write us for support:	Promise Technology Germany Europaplatz 9 44269 Dortmund, Germany

Italy

E-mail Support	e-Support On-Line
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Limited Warranty

Promise Technology, Inc. (“Promise”) warrants that this product, from the time of the delivery of the product to the original end user:

a) all components for a period of three (3) years;

b) will conform to Promise’s specifications;

c) will be free from defects in material and workmanship under normal use and service.

This warranty:

a) applies only to products which are new and in cartons on the date of purchase;

b) is not transferable;

c) is valid only when accompanied by a copy of the original purchase invoice.

d) Is not valid on spare parts.

This warranty shall not apply to defects resulting from:

a) improper or inadequate maintenance, or unauthorized modification(s), performed by the end user;

b) operation outside the environmental specifications for the product;

c) accident, misuse, negligence, misapplication, abuse, natural or personal disaster, or maintenance by anyone other than a Promise or a Promise-authorized service center.

Disclaimer of other warranties

This warranty covers only parts and labor, and excludes coverage on software items as expressly set above.

Except as expressly set forth above, Promise DISCLAIMS any warranties, expressed or implied, by statute or otherwise, regarding the product, including, without limitation, any warranties for fitness for any purpose, quality, merchantability, non-infringement, or otherwise. Promise makes no warranty or representation concerning the suitability of any product for use with any other item. You assume full responsibility for selecting products and for ensuring that the products selected are compatible and appropriate for use with other goods with which they will be used.

Promise DOES NOT WARRANT that any product is free from errors or that it will interface without problems with your computer system. It is your responsibility to

back up or otherwise save important data before installing any product and continue to back up your important data regularly.

No other document, statement or representation may be relied on to vary the terms of this limited warranty.

Promise's sole responsibility with respect to any product is to do one of the following:

a) replace the product with a conforming unit of the same or superior product;

b) repair the product.

Promise shall not be liable for the cost of procuring substitute goods, services, lost profits, unrealized savings, equipment damage, costs of recovering, reprogramming, or reproducing of programs or data stored in or used with the products, or for any other general, special, consequential, indirect, incidental, or punitive damages, whether in contract, tort, or otherwise, notwithstanding the failure of the essential purpose of the foregoing remedy and regardless of whether Promise has been advised of the possibility of such damages. Promise is not an insurer. If you desire insurance against such damage, you must obtain insurance from another party.

Some states do not allow the exclusion or limitation of incidental or consequential damages for consumer products, so the above limitation may not apply to you.

This warranty gives specific legal rights, and you may also have other rights that vary from state to state. This limited warranty is governed by the State of California.

Your Responsibilities

You are responsible for determining whether the product is appropriate for your use and will interface with your equipment without malfunction or damage. You are also responsible for backing up your data before installing any product and for regularly backing up your data after installing the product. Promise is not liable for any damage to equipment or data loss resulting from the use of any product.

Returning the Product For Repair

If you suspect a product is not working properly, or if you have any questions about your product, contact our Technical Support Staff through one of our Technical Services, making sure to provide the following information:

- Product model and serial number (required)
- Return shipping address
- Daytime phone number
- Description of the problem
- Copy of the original purchase invoice

The technician will assist you in determining whether the product requires repair. If the product needs repair, the Technical Support Department will issue an RMA (Return Merchandise Authorization) number.

Important

Obtain an RMA number from Technical Support *before* you return the product and write the RMA number on the label. The RMA number is essential for tracking your product and providing the proper service.

Return ONLY the specific product covered by the warranty (do not ship cables, manuals, diskettes, etc.), with a copy of your proof of purchase to:

USA and Canada:	Promise Technology, Inc. Customer Service Dept. Attn.: RMA # _____ 47654 Kato Road Fremont, CA 94538
Other Countries:	Return the product to your dealer or retailer. Contact them for instructions before shipping the product.

You must follow the packaging guidelines for returning products:

- Use the original shipping carton and packaging
- Include a summary of the product's problem(s)
- Write an attention line on the box with the RMA number
- Include a copy of proof of purchase

You are responsible for the cost of insurance and shipment of the product to Promise. Note that damage incurred due to improper transport or packaging is not covered under the Limited Warranty.

When repairing returned product(s), Promise may replace defective parts with new or reconditioned parts, or replace the entire unit with a new or reconditioned unit. In the event of a replacement, the replacement unit will be under warranty for the remainder of the original warranty term from purchase date, or 30 days, whichever is longer.

Promise will pay for standard return shipping charges only. You will be required to pay for any additional shipping options (such as express shipping).

Appendix A: Partition and Format

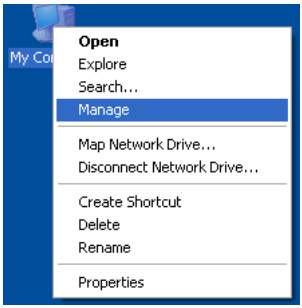
In order for your operating system to recognize and work with the physical drives attached to your SuperTrak TX Controller card, the drives must be partitioned and formatted.

- If your drives were previously partitioned and formatted they are ready to use and you can skip this procedure
- If your drives have not been partitioned and formatted, you must do that job before you can use them

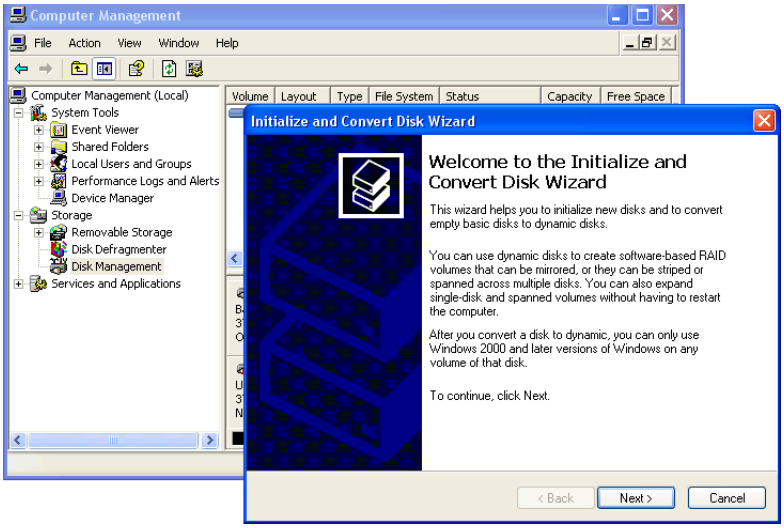
The actions of partitioning and formatting create a file structure on the physical drives with which your operating system can work. In the example below, we show how this is done in Windows. A similar procedure is required for Linux PCs. However, partitioning and formatting in Linux is not automated, therefore please refer to your system documentation for the exact procedure.

Note

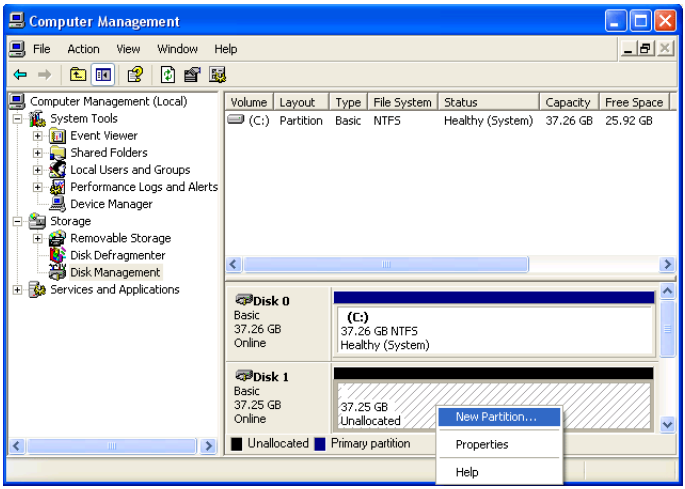
If you plan to boot your computer from this logical drive, you will perform partitioning and formatting during the OS installation. The instructions here are for data logical drives only.



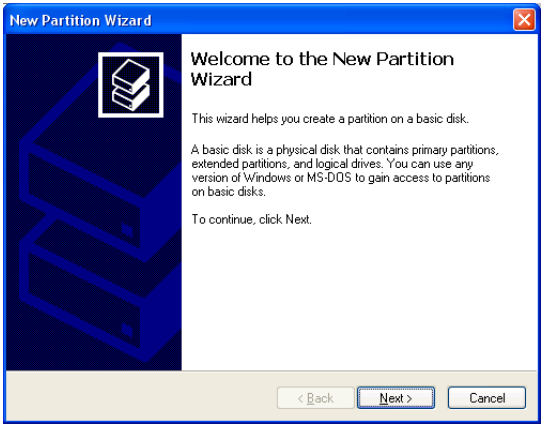
1. From the desktop, right-click the **My Computer** icon and choose *Manage* from the popup menu. The Computer Management window opens.
2. From the left menu, click **Disk Management**. The Disk Management window opens with your new logical disk identified as Disk 1. The Initialize Wizard appears automatically.


Computer Management
File Action View Window Help
Computer Management (Local)
System Tools
Event Viewer
Shared Folders
Local Users and Groups
Performance Logs and Alerts
Device Manager
Storage
Removable Storage
Disk Defragmenter
Disk Management
Services and Applications
Volume Layout Type File System Status Capacity Free Space
Initialize and Convert Disk Wizard
Welcome to the Initialize and Convert Disk Wizard
This wizard helps you to initialize new disks and to convert empty basic disks to dynamic disks.
You can use dynamic disks to create software-based RAID volumes that can be mirrored, or they can be striped or spanned across multiple disks. You can also expand single-disk and spanned volumes without having to restart the computer.
After you convert a disk to dynamic, you can only use Windows 2000 and later versions of Windows on any volume of that disk.
To continue, click Next.
< Back
Next >
Cancel

3. Click the **Next** button to start the Wizard.
4. In the following windows, choose Disk 1 to Initialize. Do not choose any disks to Convert. Click the **Finish** button to Initialize the logical disk.

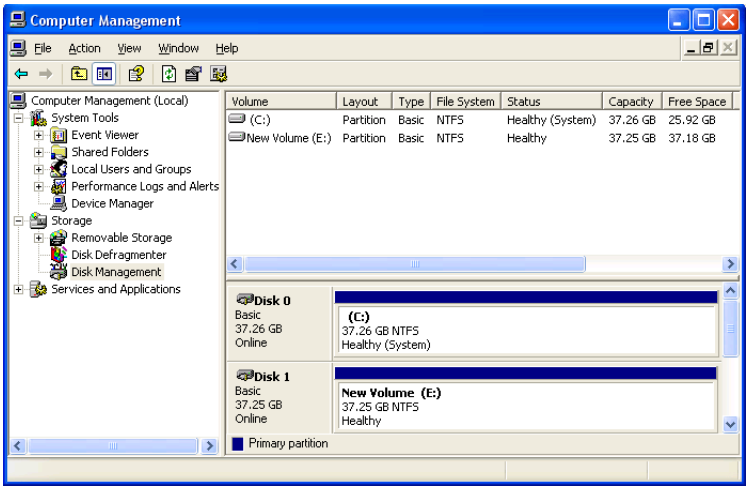


5. Right-click the **Unallocated** portion of Disk 1 and choose *New Partition...* from the popup menu. The New Partition Wizard appears.

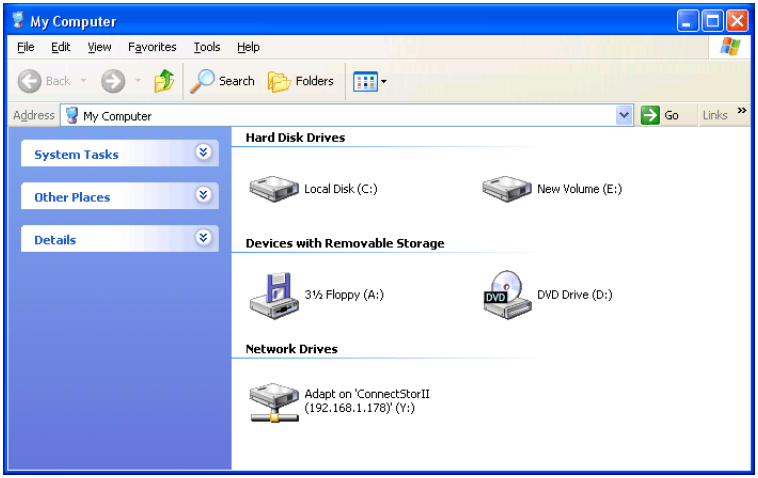

New Partition Wizard
Welcome to the New Partition Wizard
This wizard helps you create a partition on a basic disk.
A basic disk is a physical disk that contains primary partitions, extended partitions, and logical drives. You can use any version of Windows or MS-DOS to gain access to partitions on basic disks.
To continue, click Next.
< Back
Next >
Cancel

6. Click the **Next** button to start the wizard.
7. In the following windows, do the following actions. Click **Next** to move to the next window.
   - Choose Primary Partition
   - Specify the maximum available partition size in MB
   - Assign the available drive letter of your choice
   - Choose Format this partition with the following settings
   - File system: NTFS
   - Allocation unit size: Default
   - Volume label: Enter your choice of name
   - Do not check “Perform a quick format” or “Enable file and folder compression”
8. Review your selections and click **Finish**. The New Partition Wizard will disappear while partitioning and formatting begin.

   This process will take some time. The Disk Management window displays the progress.



When formatting is complete, your logical disk will appear as a hard drive in the Disk Management window (above) and the My Computer window (below).



Appendix B: Upgrades

- Updating SuperTrak BIOS and Firmware (page 211)
- Updating WebPAM PRO (page 213)

Updating SuperTrak BIOS and Firmware

Follow this procedure to upgrade the BIOS and Firmware on your SuperTrak TX8650 or TX8658 Controller card.

The SuperTrak card must be properly installed in your PC or server in order to perform the update. See “Installing the SuperTrak Card” on page 8 for more information.

Downloading BIOS and Firmware File

1. Go to the Promise Support Website at http://support.promise.com/.
2. Click *Downloads*.
3. Click the Select Product popup menu and choose *SuperTrak TX8650/ TX8658*.
4. Click the Select Category popup menu and choose *All*.
5. Click the **GO** button.

   The list of available downloads displays. The firmware and BIOS come together in a single image. The installer utility comes separately.
6. Click the latest package for your system.
7. In the File Download dialog box, click the **Save** button.
8. In the Save As dialog box, direct the file to save to a convenient location on your PC.
9. Repeat steps 6 through 8 for the installer utility.

   The flash utility is named **flashseq.exe**.

   The firmware and BIOS image file is named **tper.img**.

Important

After you update your BIOS and Firmware, install the latest SuperTrak driver for your OS. See “Chapter 3: Installing Drivers” on page 53.

Updating the BIOS and Firmware on SuperTrak

Caution

This procedure can result in loss of data. Follow instructions carefully.

1. Attach a USB memory stick or USB hard drive to your PC or server.
2. Back up any critical and important data from the USB stick or drive.
3. Reformat the USB stick or drive to make it DOS bootable.
4. Copy the firmware and BIOS image and the installer utility that you downloaded from the Promise website to the USB disk or drive.
5. Close all applications and reboot your PC or server.
6. Optional. Change the PC or server's boot settings as required to boot from the USB device before the PC or server boots from the installed hard drive.
7. When the boot prompt appears, type **dir** (Windows) or **ls** (Linux) and press Enter to display the contents of the root directory.

   Among other files and directories, you should see:

   `FLASHSEQ EXE` – The flash utility
   `TPER IMG` – The firmware and BIOS image file
8. Type **flashseq w tper.img** and press Enter.

   The flash utility begins running.

   If you have two SuperTrak controllers installed in your PC or server, the flash utility automatically updates both controllers.

   When the screen displays:

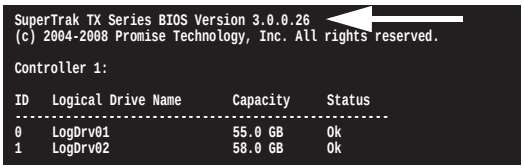
   ```
   All Done!
   Press any key to reboot...
   ```

   The BIOS and firmware upgrade is finished.
9. Reboot your PC or server and remove the USB stick or drive.

   Restore your boot settings if necessary.

   When the SuperTrak BIOS screen appears, you will see a new version number.

Figure 1. SuperTrak BIOS screen


SuperTrak TX Series BIOS Version 3.0.0.26
(c) 2004-2008 Promise Technology, Inc. All rights reserved.
Controller 1:
ID Logical Drive Name Capacity Status
0 LogDrv01 55.0 GB Ok
1 LogDrv02 58.0 GB Ok

Updating WebPAM PRO

Follow this procedure to upgrade the WebPAM PRO Software on your PC or server.

Downloading the WebPAM PRO Update File

1. Go to the Promise website http://support.promise.com/.
2. Click *Downloads*.
3. Click the Select Product popup menu and choose *SuperTrak TX8650/ TX8658*.
4. Click the Select Category popup menu and choose *Utility*.
5. Click the **GO** button.

   The list of the current WebPAM PRO software displays. Promise provides versions of WebPAM PRO software for Windows and Linux. Be sure you choose the latest version.
6. Click the WebPAM PRO file you want.
7. In the File Download dialog box, click the **Save** button.
8. In the Save As dialog box, direct the software to save to a convenient location on your PC.
9. Unzip the downloaded WebPAM package.

   The result is a single installer file.

Installing the WebPAM PRO Update File

You must manually un-install the existing version of WebPAM PRO before installing the new one.

See “Installing onto Windows” on page 18 or “Installing onto Linux” on page 23.

Logging into WebPAM PRO

The new version of WebPAM PRO has the same login procedure as previous version. See “Logging into WebPAM PRO” on page 49 or page 83.

Appendix C: LED Backplane Connections

- Schematic Diagrams (below)
- Direct LED Display (page 217)
- Aggregate LED Display (page 217)
- Global LED Display (page 218)

Schematic Diagrams

To set up LED configuration for your enclosure or PC, make your backplane connections as shown below. You can make connections for:

- Aggregate LEDs
- Global LEDs in two colors
- Direct connection – Individual fault and activity LEDs

  For SuperTrak TX8658, note that only the *interior* SAS Ports have individual LED pins.

For more information, see “Installing the SuperTrak Card” on page 8 and the user manual for your PC or enclosure.

Figure 1. SuperTrak Aggregate and Global LED backplane connections

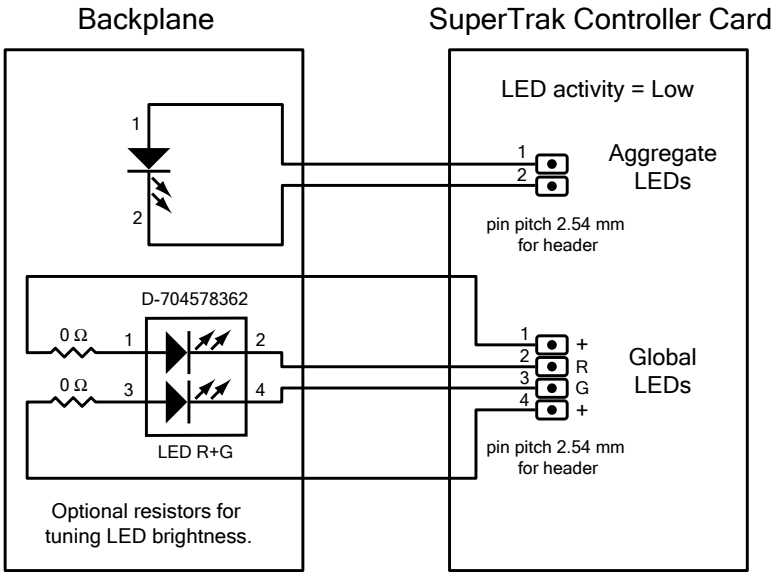
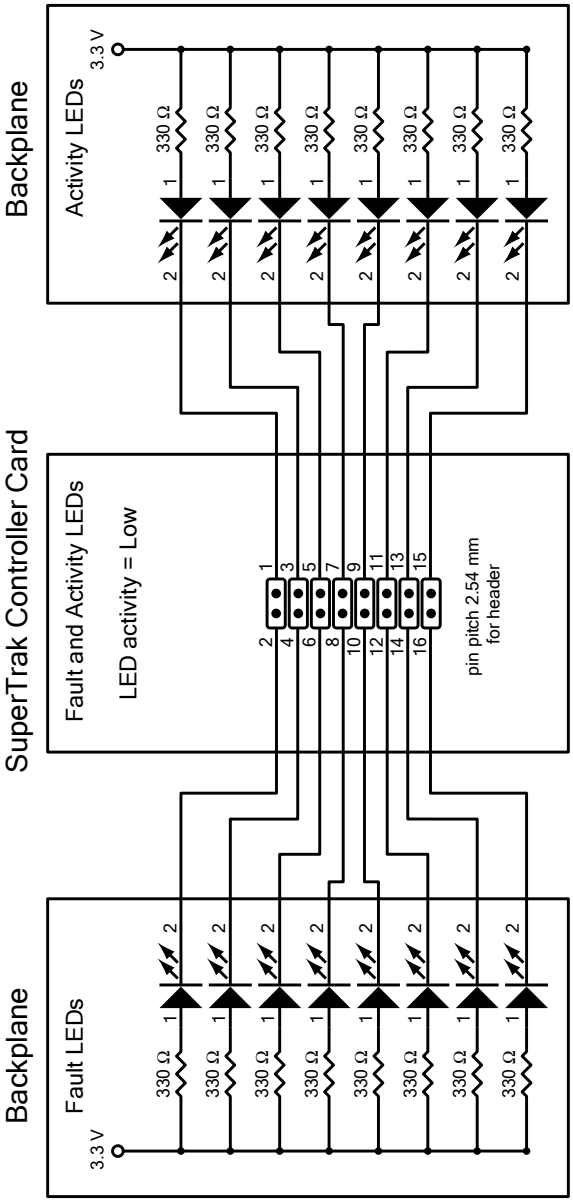


Figure 2. SuperTrak fault and activity LED connections



For LED status and behavior information, see the tables on the following pages.

Direct LED Display

Direct LEDs, glow and blink in response to the SuperTrak's firmware status.

Fault LED	Activity LED	Firmware Status
OFF	OFF	No physical drive
ON	ON	Unconfigured physical drive
OFF	ON	Configured physical drive – Status OK
ON	ON	Configured physical drive – Status Not OK
OFF	ON	Global spare drive – Status OK
ON	ON	Physical drive – Status Dead
ON	ON	Stale condition
Blink	ON	Rebuilding
OFF	Blink	Activity
Blink	ON	Locate physical drive
Blink	ON	Locate logical drive
Blink	ON	Locate disk array

For more information, see:

- "Managing Physical Drives" on page 68 or page 117
- "Managing Disk Arrays" on page 70 or page 120
- "Managing Logical Drives" on page 73 or page 133
- "Managing Spare Drives" on page 77 or page 137

Aggregate LED Display

Aggregate LEDs glow or blink in response to Storage Device (physical drive) activity.

LED	Storage Device Status
OFF	No activity
ON	Storage device (physical drive) activity

Global LED Display

Global LEDs glow in response to Logical Drive status.

LED	Logical Drive Status
Dark	System off
Green	Normal
Amber	Logical Drive Critical
Red	Logical Drive Offline

When a Global LED glows amber or red, you must diagnose and resolve the logical drive problem in the SuperBuild BIOS or in WebPAM PRO.

See “Chapter 8: Troubleshooting” on page 183.

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